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PHYSICAL SCIENCE IN THE WORK OF EDUCATION.

REV. DR. GREEN'S ADDRESS LAFAYETTE COLLEGE,

JULY 25, 1865.

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THE

VALUE OF PHYSICAL SCIENCE

IN THE

WORK OF EDUCATION.

AN ADDRESS DELIVERED JULY 25th, 1865, UPON LAYING THE CORNERSTONE OF THE JENKS CHEMICAL HALL

AT LAFAYETTE COLLEGE.

BY

REV. W. HENRY GREEN, D. D.,
Professor in the Theological Seminary, Princeton, N. J.

PRINTED BY ORDER OF THE BOARD OF TRUSTEES.

EASTON, PA.
1865.

EXTRACT FROM THE MINUTES OF THE BOARD OF TRUSTEES.

LAFATETTE COLLEGE, July 26, 1865.

Resolved, That the thanks of this Board be presented to Barron H. JEWES, Esq., of Bridesburg, for his generous offer to erect a suitable building for the use of the Chemical Department of this College.

Resolved, That President Cattell, Professors Traill Green, and J. H. Coffin, Mr. James McKern, and M. Halb Jones, Esq., be a Committee to superintend the erection of the building after the design furnished by John McArthur, Jr., of Philadelphia, and that said building be known as the Jenes Chemical Hall.

Resolved, That the thanks of the Board be presented to the Rev. Professor W. Henny Green, D. D., for his address of yesterday, delivered by request of the Faculty, at the laying of the corner-stone of the new Hall, and that a copy be requested for publication.

Printed by ALFRED MARTIEN, 606 Chestnut Street, Philadelphia.



ADDRESS.

WE are met to lay the corner-stone of THE JENKS CHEMICAL HALL. Connecting this event with its probable consequences, we may pronounce it one of real magnitude. Every right impulse given to the cause of education is of incalculable value. Every addition to the means, every increase of the facilities of manly culture deserves to be hailed with gratitude and joy. He who extends the advantages of intellectual and moral training to those who would not otherwise have possessed them, or renders more complete and thorough the discipline of mind and heart of those who are in a course of instruction, ought to be held in honour as a public benefactor. And when this is done by a permanent foundation, whether by the erection of neat and appropriate buildings, such as that which is here contemplated for scientific uses, or by endowments securing in perpetuity a succession of able and qualified teachers in sufficient numbers, or affording to deserving but needy pupils the requisite pecuniary assistance, we see one of the noblest uses to which

money can be put, and we admire their largeness of heart and breadth of view and far-sighted benevolence, to whom God has given along with wealth this comprehension of its real value, and the wisdom to convert it into exhaustless mines of treasure, which cannot be weighed with gold.

The great problem in our collegiate system is to combine in the most effective manner the wide diffusion of liberal culture with the highest possible attainments. As institutions of learning are multiplied, the advantages which they offer are put within reach of greater numbers, and many are induced to avail themselves of privileges cheaply offered and brought to their doors, who would have been deterred by distance and expense. Each creates about itself a fresh circle of literary influence, and inspires a zeal for learning in some at least who would never have felt the stimulus of remoter institutions even though they were of a higher order.

There is a danger, however, of dissipating our forces, and wasting our strength by scattering upon too many points what could only be really effective by being concentrated upon a smaller number. No small injury has resulted to American scholarship by the solicitude to increase the number, irrespective of the character of our colleges. If they be feebly manned and poorly equipped, they are an evil and an incumbrance, stand-

ing in the way of others and a check upon their prosperity, while doing a real injury to as many as resort to them, who are cheated out of the education which they might have obtained elsewhere.

A college to fulfil its true idea, and to answer in any worthy manner the end of its establishment, ought to be possessed of ample facilities for the work of a thorough education. It should be possessed of an adequate corps of instructors well versed in their various departments, of abundant apparatus of the best description, of large and well selected libraries, of scientifically arranged cabinets and museums. It ought to be in an eminent sense a seat of learning, a centre of instruction not only to the immediate body of pupils gathered there, but from which knowledge should radiate to the wider public. The professors should be provided with all the appliances necessary for prosecuting learned investigations and engaging in the work of scitific research and discovery, so that they might be advancing the boundaries of knowledge and making additions of permanent value to the general stock of our literature. All this cannot be without large endowments. The outlay involved is necessarily very great, though the returns will be such as abundantly to compensate for it.

Every true friend of LAFAYETTE is rejoiced to see her bestirring herself with such zeal and such a hopeful

measure of success in this direction. The leading institutions of the country have been moved as by one common impulse to seek the enlargement of their endowments, and thus increase their facilities for imparting a broad and thorough culture. And the noble and generous response made to these solicitations will always remain an honourable record. That during a civil war of such magnitude, entailing such sufferings and losses, and demanding such enormous expenditures in its prosecution, the American public not only bore uncomplainingly the burdens thus necessarily imposed upon them, but continued still to sustain with even more than their former vigour their accustomed charities and operations of religious benevolence, and added to these those extraordinary contributions poured forth without stint in aid of the Christian and Sanitary Commissions and kindred agencies, and beyond all, contributed princely sums, greater than at any former period, for the permanent endowment of literary and theological institutions; this may well stand to the credit of our people and repel the charge so often made of sordidness and supreme devotion to mere material wealth.

We accept it as a pledge and augury for the future, that in this new stage of its history upon which our country is now entering, a higher style of education will be sought after and insisted upon, than has thus far been attained to. In the preliminary work of opening up this vast continent, such has been the demand for labour in every department, that men grudged the time required for a thorough training. The necessity was so urgent, that poorly furnished workmen were better than none. We are now passing into a more settled state of things, for which the convulsions of the last four years seem designed to prepare the way. It was a question whether such an extent of territory could be held together, and whether, as our population expanded, it would not fall asunder of its own weight; whether the divergent tendencies of individual freedom and of distinct local governments would not prove too strong for the central authority; whether our very prosperity was not depraving our national character, and engendering a weakness which was the precursor of dissolution; and whether the system of slavery, which had been first tolerated and then petted, though diametrically opposed to the principles of our government, was not gaining such control over our national councils as to make this free nation the propagandist of bondage.

These questions were to be met and settled before we could be suffered to grow into a populous nation. The providence of God has brought them, as we hope and trust, to a final solution. A sentiment of nationality has been developed, crushing every tendency to secession and disintegration, and inspiring the whole

people with the instinct of a common life. The heresy of unlimited State sovereignty has been effectually rebuked, and the true doctrine of our national Constitution has been vindicated by the strong arm of the people. A spirit of heroic self-sacrifice and devotion to the public good has been awakened in the heart of the nation, which will not lightly part with that for which it has toiled and suffered, as it did from the assault upon Sumter to the surrender of Lee. And slavery has ceased to be.

These perils are now past. Our institutions have been tested and purged. They are actually stronger than they were, and our confidence in them has been increased. They have borne the sudden and enormous strain to which they have been subjected, and have demonstrated their capability to bear the pressure to which expanding numbers and advancing time will be sure to subject them. It is the experimental test prior to actual use. We are now, under the leadings of God's good providence, to unfold ourselves to a mighty people, and to develope the civilization for which he has destined this continent, with its marvellous structure, its amazing resources, and its wonderful history.

To guide in this developement, and to make it what it should be, the highest powers of mind and heart will be required. We need in our statesmen and legislators, we need in our ambassadors at foreign courts, we need in every profession and line of life, what we have learned at a terrible cost was needed in our generals. A thorough course of training appropriate to their work is necessary to fit them for it. Third and fourth-rate men will answer the necessities of the country no longer. We want well-developed, full-grown men, whose powers have been cultivated to the highest attainable point—the ablest and best who can be produced—who have had every advantage for self-culture afforded them, and have made good use of their advantages. The fostering care bestowed in this great crisis upon our educational institutions is full of hope, as it shows that the quick sense of our countrymen has discerned the urgent want of the times, and is bent upon having it supplied.

The Hall, whose corner-stone we are about to lay, suggests by contrast the straitened accommodations for the chemical class in the model school basement, and the slender apparatus of my college days. The only matter of astonishment, is that so much was accomplished in the way of experiment and illustration by the ingenuity and skill of our respected instructor, the same who still adorns this department, and the only link remaining to connect the faculty as it is now and as it then was. It is a matter of sincere congratulation, in which I am sure all his former pupils and all the friends of the College will join, that his past ser-

vices and his eminent abilities have met the recognition to which they are entitled; and that instead of struggling in the future, as he has done in the past, against untold disadvantages in his work of instruction, he is henceforth to be provided with the needed appliances, and to have a laboratory and apparatus worthy of the College, befitting the present advanced state of chemical science, and which will compare favourably with those of the best institutions of the country. But one thing more is needed to put this department on the best possible footing, and to make it all that any friend of education can desire—a step the natural sequel of that which has been taken this day, and which, I trust, a generous and appreciative public will not suffer to be long delayed, viz., that this professorship should be fully endowed, and my respected friend and teacher, whose admirable fitness for the post is confessed by all who know him, should be relieved from the exacting demands of his medical practice, and enabled to devote his undivided strength to the proper duties of his professorship.

And I cannot forbear in passing to congratulate the College upon the whole series of buildings—finished, begun, and projected, which are to adorn this hill; and particularly upon that whose corner-stone we saw laid last year, and which, besides its general and obvious connection with my theme, has an intimacy of relation

with it, which they who are acquainted with the munificent donor, will appreciate. It, too, by contrast, suggests memories of the past, of the honoured and lamented MACARTNEY, whose panegyric I would love to pronounce, if this were the proper place and time. I recall, as though it were yesterday, the gathering of my class about him on the College campus one starlight night, as he pointed out the leading constellations, traced the path of the sun in its annual course through the heavens, and indicated the principal lines upon the celestial globe,—the observations taken from the College cupola on the day of the annular eclipse,* and the sundry uses of quadrants, theodolites, &c., for obtaining the elements wherewith to compute latitude, longitude, and various celestial phenomena. I cannot but think what effective use he would have made for purposes of instruction, and for purposes of science, of this observatory, with its equatorial, its transit, and other instruments; and I rejoice at the facilities put into the hands of his accomplished successor, and which will doubtless increase a scientific fame already widely spread.

The present advance of education is taking more and more the direction of natural science, not with the view of superseding the existing curriculum, but of supplementing it. We see this in the various scientific

^{*} September 18th, 1888.

schools and agricultural schools, and schools for the arts and for mining, which are founded as separate institutions, or erected in connection with our best endowed colleges. We see it in State endowments for these purposes. We see it in the growing public demand for that particular style of instruction, which must be met in some form or other. We see it in acts of munificence, like that which has prompted the founding of this astronomical observatory, and this chemical hall.

The reasons which have contributed to and which justify this movement, are manifold.

One of the most important is derived from the part, which it is coming to be more and more distinctly seen, the natural sciences are capable of taking in the training of the mind, in that which is the grand aim of a liberal education, the development of the man.

The materials for the mental training of each generation are to be found in the intellectual achievements of its predecessors. Another can teach us only by leading us to think the thoughts which he has had, and to rise to the conceptions which he has gained. It is by exercising them in the realms of truth, under the guidance of those who have already explored them, that our powers grow. It is by toiling through the passes over which former travellers have made their way, and clambering up the steps which they have hewn in the

precipitous rock, that we acquire strength of muscle and firmness of tread. The most effective discipline for strengthening and expanding the mind is setting it to grapple with the problems that the great master spirits of our race have struggled with and laboured at, and shown us how to solve.

There is a deep philosophy in the common word information. It implies that the impartation of knowledge informs the mind, gives shape and form and character to what would otherwise be confused, chaotic and unmeaning. The intellect untaught is like shapeless, unwrought material, "rudis indigestaque moles." Knowledge exerts a moulding influence upon it, brings its hidden faculties into conscious exercise, developes its latent capabilities, gives bent and direction to its powers, acts the part of the sculptor who discovers shapes of beauty in the marble which only had an ideal existence there before.

The best system of education that can be devised in any age or country, will depend upon the sum of knowledge which is possessed and can be made available for the training of the mind. Mathematics owes its name to the fact that in the early period of Greek culture it constituted the course of study— $\mu a \partial \eta \mu a \tau c c d$, "the things to be learned." It was the only well developed body of knowledge then existing that deserved the name of a science. And the clearness and

precision of its ideas, the rigour of its methods, and the evidence and certainty of its results, made it a favourite discipline with reasoners. It has retained its place in the curriculum of liberal study ever since. But meantime how has it been expanded by the modern analysis and the calculus, by new applications to mechanics and optics, to the laws of fluids and the motions of the stars, to every branch of physical science and of human art? And who would now dream of limiting a course of mathematical study to the geometry which Plato made preliminary to an entrance upon philosophy?

The well-known trivium and quadrivium which composed the curriculum of the middle ages, embraced the principal branches of science cultivated then.

The revival of classical learning introduced the study of the polished languages of Greece and Rome among the regular branches of education, at first chiefly for the sake of an introduction to that elegant and varied literature to which they afford the key, afterwards in addition for the discipline of mind which the mastery of the tongues themselves imparted. But how much does the study of language now involve beyond what was thought of or imagined at the beginning! The entire science of philology, with its revelations of the inner structure, the growth and the affinities of tongues is of recent growth.

Physical science has very commonly been under-

valued as a means of education. It is said, and very properly, that the principal aim of the college course is not the communication of knowledge, but the discipline of the mind. Still, if the views presented are correct, these are not independent of one another. It is by the reception of knowledge that the mind is stimulated to activity and its powers put to their proper use, so that they can receive their just expansion and development. Mere collections of facts, however carefully observed and exactly recorded, would, it is true, be of small account in the training of the mind. A meteorological register would be of no avail for purposes of education. Facts unconnected and unexplained are mere lumber in the memory of the student. They do not educate. They require no thought, no processes of comparison, judgment, or reasoning. They suggest no clear ideas. They do not constitute science. Science implies classification and arrangement: phenomena must be traced to their causes, principles be connected with their consequences, and the ideas which govern the whole be clearly set forth.

The vulgar eye looks at the flame of a candle and sees nothing but a very ordinary affair, which scarce attracts attention. Science detects in that hollow pyramid of incandescent carbon, which we call flame, a world of wonders. The laws of decomposition and recombination are therein illustrated; the equilibrium

of forces acting in various directions to which the blaze owes its steadiness and regular shape, its apparent continuity, though made up of minute and separate particles, and its seeming permanence though renewed like the rainbow at every successive instant; the tremendous energy of these forces, which is such that the molecules of oxygen eliminated from the surrounding air, impinging from infinitesimal distances upon molecules of solid carbon disengaged from the gas which held them in combination, produces an intensity of heat greater than ponderous trip-hammers urged by the most powerful machinery can produce by repeated strokes on bars of metal, and suggesting among its endless analogies and relations that sublime cosmical hypothesis which finds an adequate cause for the permanent and undiminished heat of the sun in a like play of forces and the impinging of nebulous matter upon its surface; and beyond all the mysterious nature and wide connections of light and heat are opened for consideration. So that it is not surprising that one of the most distinguished chemists of the present day made the flame of a candle his text in a most instructive series of lectures, such as it would be in a high degree educating to listen to and to follow.

That amber when rubbed draws light substances to itself, and that the loadstone attracts iron, were phenomena known to the ancients. But they had no

notion of the causes that produced them, or of their multitudinous relations. They never thought of any laws involved, or principles that had a wider range of application. And yet when curiosity had been stimulated to careful investigation and these vague hints were followed out to their results, it was found that these seemingly isolated phenomena were after all not freaks of nature, but starting points of an extensive The discovery that in each case the attraction was matched by a counter-repulsion, gave birth to the idea of polarity with all its wonderful applications. The agents in these phenomena were further recognized on a large scale in the sphere of the world; the one in the lightning flash and various electrical manifestations, the other in the magnetic condition of our globe. The properties of these two analogous and yet dissimilar fluids, if so they are to be called, open a broad range for separate investigation. A third discovery, which ran its independent course for awhile, served however ultimately to combine them at the same time that it threw the tract of investigation still more widely open. The galvanic fluid possessing remarkable properties of its own and yet capable of producing all electrical phenomena on the one hand, and magnetic on the other, compels to the conclusion that what were once reckoned three distinct fluids, are in reality modifications of but And the wonderful affinities and conone agent.

nections which this has with light and heat, raise the query whether they too are not ultimately traceable to And further still in this prothe same common source. cess of extension and simplification, this same agent has been recognized as the bond of chemical affinity. The power, which holds the elements of compound bodies in combination, can be thrown into the form of a current of electricity and conducted along the voltaic wire: this power can be accurately measured and subjected to rigorous computation, and thus Faraday demonstrated that the gaseous elements of a single grain of water are held together by an electrical force equivalent to 800,000 discharges of his Leyden battery, or a powerful flash of lightning. And this again explains the secret of the definite proportions in which alone chemical composition takes place; the combining equivalent of each simple element, denoting the constant proportion in which it enters into its various combinations, being precisely represented by its fixed electrical quality.

It is needless to multiply these illustrations. The simplest matters of observation involve principles or are traceable to causes which have endless ramifications. The study of physical science which redeems individual facts from their isolation, substitutes clear and precise conceptions for vague and indefinite notions, which refers phenomena to their laws and effects to their causes, brings into operation the faculties of the mind

and gives them that training and developement which is the object of every wise scheme of education.

The educative power of the physical sciences appears further from the amount of vigorous thought which has been expended in their formation, the impress of which they consequently bear in their own structure, and leave more or less distinctly upon all the minds that are brought into contact with them. Men of the highest acuteness and ingenuity have patiently exercised themselves through successive ages in solving the problems which nature spreads before them. It is upon the products of their toil our minds employ themselves, and by the treasure they have amassed, we are enriched. In the beautiful language of Professor Whewell—"The present generation inherits and uses the scientific When the humblest wealth of all the past. inquirer counts his little wealth, he finds that he has in his hands coins which bear the image and superscription of ancient and modern intellectual dynasties; and that in virtue of this possession, acquisitions are in his power, solid knowledge within his reach, which none could ever have attained to, if it were not that the gold of truth, once dug out of the mine, circulates more and more widely among mankind."*

Even the elemental ideas of science, the foundation on which all rests, and without which no structure could

Philosophy of the Inductive Sciences, vol. i. p. 271.

be reared,—ideas which once gained and clearly stated carry their own evidence with them, and are accepted as axioms, were nevertheless elaborated by the struggles of ages, and men worked their way up to them by a slow and tedious process. To the uninstructed, nature is a vast enigma, containing only the most obscure and distant hints of its own true solution. Patient and protracted search, involving many fruitless endeavours and many perplexed and devious wanderings, was the condition precedent to the discovery of the truth. Why does a stone continue to move after it has left the hand by which it is thrown? And why is its motion gradually retarded until it ceases altogether? These were questions that all antiquity could not answer. The great Aristotle had nothing better to suggest than that there was a motion communicated to the air, the successive parts of which urge the stone onwards. cessation of the motion was universally attributed to the sluggishness of the material, and its inherent disposition to return to a state of rest. The conception had never dawned upon their minds, which we now hold to be axiomatic, that matter has no tendency to change its state whether of motion or of rest. But until this conception had been distinctly apprehended, it was impossible to make the slightest progress towards constructing a science of mechanics or determining the laws of force and motion. And then only was the way

open to determine the true character of the solar system and of the stellar universe. Without this primary principle there is no escape from the old idea that the stars are animated beings, moving in circles, as the most perfect of figures, and the earth is immovable in the centre.

The word chemistry, which comes to us from the ancient Greeks, and was perhaps borrowed by them from the Egyptians, testifies that researches in this direction began at a very early period. But how completely the ancients were groping in the dark in regard even to the first principles of the subject, appears from their doctrine of the four elements, earth, air, fire, and water. The notion fundamental to the whole subject of the elementary constituents of bodies to be determined by actual analysis, was never once dreamed of. From the Greeks the study passed to the Arabs, of whose labours we have a reminiscence in the technical terms alembic, alkali, alcohol. But how far they still were from distinct and true conceptions even in fundamental points, appears from the name of the science in its Arabic form, alchemy, which is most prominently associated with the vain endeavour to transmute the baser metals into gold. This delusion is inconsistent with the first notion of the essence of bodies, which can never lose its identity amid all mutations and combinations.

The sciences are thus built up by slow degrees; in

every part they bear the evidence of severe thought. They are the results of clear and powerful thinking persistently directed to the solution of intricate and difficult problems. From their simplest truths to their loftiest and most far-reaching deductions they bear the stamp of master intellects whom it is in the highest degree educating to follow.

But the educating power of physical science is capable of being put on higher ground than this. Though its texture is human, the material is divine. the interpreter but the handwriting is God's. office of science is not to impose human ideas upon nature, but to uncover those of the great Creator. In studying the world which he has given us to exercise our minds upon, we are pupils of the Almighty and the All-wise. We are searching into his plans. learning to think his thoughts and take in his ideas. Every arrangement down to the most minute, every method adopted, every end sought, wears the stamp of divinity. And then there is no school for grand and lofty conceptions, for ideas fitted to enlarge the mind, exalt its powers and kindle its enthusiasm like this in which our Maker is our teacher. What could give a practical impression of the vastness of immensity and boundless space like the lessons of astronomy,—or of the unnumbered ages of a past duration like the revelations of geology,—or how purely relative are the terms

great and small, like the teeming millions of microscopic life converting a tiny drop into a world of animated being.

And what can surpass in grandeur those bold yet simple inductions of the invariable permanence of matter and of force. No natural agency, no created being can alter the amount of matter in the universe to the extent of an atom, or change the sum of force to the extent of the feeblest impulse. They can add nothing to it; they can take nothing from it. They may burn, pulverize, scatter to the winds, strew upon the sea, convert into invisible vapor, but they cannot annihilate a particle, or destroy one of its essential properties. Every atom of oxygen that the world contained at its formation, is in it now, and will so continue to the end of time, with all its properties precisely as they were at the beginning. It may have been breathed in air, and drunk in water, and eaten in food, it may have waved in the forest and roamed in the animal, it may have been hewn out in the rock and smelted in the ore,—it may have entered successively into thousands upon thousands of combinations:—and yet through all these shifting forms, and after all these various uses, it remains unwasted, undiminished, and unaltered, without the slightest modification in any of its properties, the same unvarying atom, changeless in the midst of limitless, incessant change.

What a commentary on the language of inspiration, "I know that whatsoever God doeth it shall be forever; nothing can be put to it, nor anything taken from it." Eccl. iii. 14.

But I proceed to remark that physical studies are well adapted to cultivate qualities or habits of mind essential to a well-balanced character, or to a properly educated man. It teaches humility, that prime quality in a philosopher and indispensable element of true greatness, by showing the narrow limits within which our knowledge is confined, and the ages required to evolve truths which now appear self-evident. It teaches patience with difficulties, unbiassed love of truth for its own sake, habits of intelligent observation, the ability to extract gratification and profit from whatever is around us; and in the combination of men of various nations and of different creeds in the pursuit of a common end it gives promise of universal union and fellowship, a dim foreshadowing of that glorious future which God has promised in his word.

I cannot, however, dwell upon these and other points, which naturally suggest themselves in this connection; and shall barely pause a moment upon a single feature of character of great consequence which the discipline of these studies is calculated to cultivate in a high degree. I mean caution in drawing conclusions, not resting satisfied with deductions from partially apprehended

facts, nor generalizing too hastily from narrow premises, nor accepting that which at first sight appears plausible until it has been subjected to the most rigorous tests. This caution is characteristic of true science. always wary of being misled by false appearances, and mistaking the seeming for the real. Nothing is accepted which does not rest on a solid basis of fact, and the most cherished opinion is discarded or freely modified when it can be shown not to be coincident with well established truth. The whole range of physical inquiry is fruitful of illustrations. The history of every science is but the gradual correction of what was at first incorrectly conceived or inadequately apprehended, the elimination of errors and inaccuracies by rigidly subjecting every proposition to the test of experiment and observa-The captivating phlogiston hypothesis gave way before the increased accuracy of the chemist's balance, which established the fact that in spite of appearances and of popular belief weight was, in all cases, increased not diminished by combustion, and therefore the process is one of addition not of subtraction. Oxygen is added; not phlogiston set free.

Lavoisier ascertained that oxygen entered into the constitution of a great number of acids, and hence concluded that every acid contained oxygen; but the discovery of chlorine and hydrochloric acid showed that a limitation was necessary, which science did not fail to

make. When Dalton propounded his atomic theory he supposed that he had settled the fact of the existence of ultimate atoms and of their relative magnitudes; but further research has shown that combination in definite proportions was dependent not on the size or weight of irreducible molecules but of the electrical quality of simple bodies. There seemed to be much to favour the hypothesis of one electrical fluid, positive and negative, rather than of two, vitreous and resinous; but it is fatal to the former that it required the assumption of a mutual repulsion between the particles of matter after the electricity has been withdrawn; for bodies negatively electrified repel each other as well as those which are positively electrified. So the hypothesis that light and heat are imponderable substances long struggled for the mastery with the hypothesis of undulations; but the latter has at length possession of the stubbornly contested field. Chemists are now puzzling themselves over the mysteries of isomeric and allotropic substances—compounds of precisely the same constituents or simple substances clearly identical and mutually convertible, and yet possessing widely different properties, as oxygen and ozone, or the two forms of phosphorus. Confronted by such facts as these, what does science do? Hastily conclude that substances have no fixed properties, or manfully confess ignorance and patiently wait for a solution, assured meanwhile that a solution is possible, and that seeming inconsistencies between clearly established truths will some day be cleared up?

And when difficulties or apparent inconsistencies are alleged between physical science and revealed truth, what can the true philosopher do but that which physical science is perpetually doing in its own domain? Where the difficulty arises from a misconception or mistaken theory on one side or on the other, let the requisite correction be applied and harmony restored. Where the difficulty after every attempt at explanation remains insoluble, patiently wait for further light. Truth cannot but be self-consistent. Abandon neither the evidence of your senses on the one hand, nor the assurance of a well-established faith on the other, but calmly bide in the confident anticipation that in this, as in hundreds of instances before, an increase of knowledge will reveal the mutual consistency of the word and works of God.

I have already taxed your patience unduly, and can only hint at what I had purposed further to say.

Physical science has a claim to be included in any complete course of education, on account of its striking analogies with moral and religious truth. These belong to different spheres, but they were wrought by the same Divine hand and upon a similar model. Ideas gained in the one tend to enlarge and clear our apprehensions of the other. The language, which we constantly employ respecting the higher forms of truth, is largely

based on imagery drawn from the lower. Light is the natural emblem of truth and holiness and joy; and the knowledge of the physical properties of the former opens a fresh insight into the moral relations of the The grand simplicity of the law of attraction which pervades the universe, controlling equally what is vast and what minute, the near and the remote, constraining all to orderly and harmonious movement, exalts our conception of the sublime control of God's great law of love, by which the universe of moral being is controlled and harmonized, and made to circle around himself. In "the permanent and stable course of nature, resulting from the balance and neutralization of contary tendencies,"—centripetal struggling with centrifugal forces,—winds battling with waves, heat with cold, acid with alkali, pole set over against pole, free play allowed to mutually conflicting affinities, and opposing properties, yet all so adjusted as to form a perfect equilibrium which the roll of ages cannot disturb, there is presented an impressive counterpart to God's providential agency, in which all things work together for good, in which evil agencies and sinful passions and wicked men are made to thwart and check each other, and to promote instead of disturbing the wise and holy and beneficent purposes of the great Creator.

And what enlargement and expansion is given

to scriptural figures drawn from natural objects by gaining a fuller knowledge of those objects themselves. "The Lord God is a sun," conveys a striking and impressive truth, when we think of the sun only in his obvious character as a source of light and heat. But what new energy is given to this magnificent emblem when we learn from astronomy that he is a grand centre of attraction, and when we in addition take in that sublime generalization that the sun is the ultimate source of every form of power existing in the world. The wind wafts the commerce of every nation over the mighty deep, but the heat of the sun has rarified the air and set that wind in motion. The descending stream yields a power which grinds your grain. turns your spindles, works your looms, drives your forges; but it is because the sun gathered up the vapour from the ocean, which fell upon the hills, and is finding its way back to the source whence it came. expansive energy of steam propels your engines, but the force with which it operates is locked up in the coal, the remains of extinct forests, stored among your hills, or is derived from the wood that abounds in your forests, which now crown and beautify their summits. Both these primeval and these existing forests drew their subsistence from the sun; it is the chemical force resident in his rays, which disengaged their carbon from the atmosphere, and laid it up as a source of power for future use. The animal exerts a force by muscular contraction; he draws it from the vegetable on which he feeds; the vegetable derives it from the sun, whose rays determine its growth. Every time you lift your arm, every time you take a step, you are drawing on the power the sun has given you. When you step into the railway carriage, it is sun-power that hurries you along. When gentle breezes fan your languid cheek, and when the resistless tornado levels cities in its fury, they are the servants of the sun. What an emblem of Him, in whom we live and move and have our being!

Physical science has a further claim to take part in the education of our youth, because of the direct testimony which the world renders to its glorious author. The whole subject of final causes, and the argument from design, which offers itself at every step to the student of nature, here lie open before us.

The relations of science and revealed religion are manifold, and the points of connection are continually becoming more numerous and important. It is of the utmost moment to the intelligent Christian, and to every thoughtful man, especially to them that are to be leaders and guides of public opinion, not to say professional defenders of our holy faith, to be well informed upon the whole subject, to be put in possession of the most recent phases of opinion, and the latest results of

scientific inquiry. It is only thus that they can have a correct appreciation of the exact state of questions that are in debate. It is only thus that the friends of the Bible can be saved on the one hand from the heedless folly of abandoning or overlooking their own strong points of defence, criminally spiking their guns, and betraying them into the enemy's hands; or preserved on the other hand from resting the cause of religion on weak and insufficient arguments, linking it with false and exploded theories, and rendering not only themselves but the truth of God ridiculous by the ignorance and unskilfulness of their advocacy of it.

I can only allude to what is the most weighty consideration yet adduced, but one which it would require a volume properly to unfold.

I have not referred in my argument to the practical bearings of physical science, to the valuable uses to which this knowledge may be put in agriculture, in the mechanical arts, in manufactures, in mining, in the various trades and professions. These are obvious, and are the considerations which are commonly pressed. It is important that our schemes of education should not be disjoined too much from practical utility under the idea of caring exclusively for the training of the mind, the developement of the man. We want men trained in such a way as to fit them for ready usefulness in the active, busy world. And on the other hand we wish that

those who merely aim at what they think a direct preparation for the activities of life, should receive in connection with it a liberal education, a developement of the whole man. Hence I rejoice in the association of a scientific course with the college as a part of the curriculum to be pursued there. And I have aimed to show that it will not degrade the college curriculum, but tend to render it more complete and effective, to give to the physical sciences an enlarged share in the work of education, a share better proportioned to their magnitude and importance.

I thank you, ladies and gentlemen, for your patient attention; and join you in wishing that JENKS CHEMICAL HALL, whose corner-stone we shall now proceed to lay, may long continue to adorn this hill, to contribute to the usefulness and prosperity of LAFAYETTE COLLEGE, and to perpetuate the name of its generous founder.





COMMEMORATIVE ADDRESS

AND

ROLL OF HONOR.

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ADDRESS

COMMEMORATIVE OF THE SERVICES

OF THE

ALUMNI AND FORMER STUDENTS

OF

LAFAYETTE COLLEGE

IN THE

WAR FOR THE UNION,

DELIVERED BY

PROF. HENRY T. LEE, (Late Major 4th N. Y. Artillery,)

BEFORE THE

TRUSTEES AND ALUMNI OF THE COLLEGE, TUESDAY, JULY 24, 1866.

TOGETHER WITH THE

ROLL OF HONOR,

AND

OBITUARIES OF THE DEAD.

EASTON, PA.
PUBLISHED BY THE BOARD OF TRUSTEES.
1867.

Printed by ALPRED MARTIEN, Philadelphia. Extract from the Minutes of the Board of Trustees, March 28, 1866.

Resolved, That Henry T. Lee, A. M., a graduate of the Class of 1860, and late Major of the 4th New York Artillery, be requested to deliver during the commencement week, before the Alumni and friends of the College, an address commemorative of the part taken by the Students of this College in the late War for the Union.

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ADDRESS.

WE have met this afternoon, Friends, Students, and Alumni of Lafayette, to celebrate the part taken by our Alma Mater in the War for the Union. And while for some reasons it would seem that our last Commencement was the more fitting time for this celebration, the event has fully justified the wisdom of the postponement; for the year that is past has accumulated facts, without which this War Record of Lafayette would have been most incomplete and unsatisfactory. And more, when we met here last Commencement, the battle wreath had scarce dissolved from over our land; the wail of a nation's grief still went up bitterly; the dead were not yet buried; and, contending with these dark and bitter subjects of reflection, strove at the same time the tumultuous joy of recent victory, and the deep intoxication of delight at the first return of peace. Now, a brief year has gone, and the War for the Union has passed into history. History, dispassionate and large-sighted, whose province it is to unravel the tangled threads of passions.

principles, deeds, and motives, and from them to weave the perfect picture of the past.

In this spirit, so far as may be, I approach the subject, content to rest our case on the accumulated facts, potent in their simple eloquence to tell the story of Alma Mater's devotion to Liberty and Union. And it is of right that her sons are loyal and her record good. The very names she bears, the name of Washington and Franklin, so intimately associated with our college life, these glorious names are constant and powerful, though unseen educators of devotion to right and liberty, and loyalty to the Government which we have inherited through their labors.

Nor was the grand example of her founder and first President† without its due effect. His stern uncom-

^{*} The Literary Societies of the College are called respectively the Washington and the Franklin Literary Society.

[†] Rev. George Junkin, D. D., LL.D., at the breaking out of the rebellion, President of Washington College, Lexington, Virginia. The following extracts from Dr. Junkin's account of his "Exodus" are not inappropriate in this patriotic record of the College, which had its existence through his efforts, and to which he gave the best energies of his life. After recounting the incident alluded to above, the Dr. says: "On the morning of the 17th of April I saw a disunion flag surmounting the statue of Washington and the lightning rod. After prayer I detained the members of the Faculty and waved my hand to the students to retire. I stated to my colleagues that this thing must be stopped, &c. One of them said he had just received a petition from the students on the subject. The substance (I have not a copy) of it was, that the flag which they had erected might be permitted to remain. I stated to the Faculty that it had been placed there in violation of law, and in contemptuous resistance to my express order, and, of course, if they would grant the prayer of the petition, my course of duty would be plain and clear—I could not be

promising patriotism, which defied alike the threats of turbulent treason and the tearful eyes of beseeching friends—impelled by which he tore down the Rebel flag which desecrated the statue of Washington, crowning

coerced, but would instantly secode; and left them to deliberate, and let me know their decision.

"At eleven o'clock, the usual hour, the Junior Class came into my room. I asked whether the flag was on the top of the College, and received an affirmative answer. 'Then gentlemen,' said I, 'I am under the necessity of assuring you that I cannot submit to this kind of coercion,' and dismissed them. One rushed to the door, shouting, 'Thank God for that! Thank God for that!' and yelled his utmost, in which he was joined by a few others.

"At twelve, when the Seniors came in, I read to them the substance of what I had said to the Juniors, and which, meanwhile, to be sure of the identical words, I had written down, as follows: 'Is the flag still on the top of the College?' Answer, 'Yes.' 'Well then, gentlemen, as you have put it there in express opposition to my order, I am under the necessity of telling you that I have never been ridden over rough-shod in that style, and I never will be; therefore I never will hear a recitation or deliver a lecture under a rebel flag. The class is dismissed.' They rose and withdrew in the most gentlemanly and respectful manner, with every appearance of sincere regret."

In the evening of the same day Dr. Junkin received a paper from the Faculty which concluded with the following resolution:

"Resolved, That the flag be permitted to remain, at the discretion of the Faculty."

He immediately called a meeting of the Board of Trustees and tendered his unconditional resignation, which was accepted with many manifestations of high personal esteem. "Thus," says Dr. Junkin, "within twenty hours from the time I was informed that my colleagues had determined to permit the secession flag to wave over the head of Washington, my connection with the college which he had so nobly endowed ceased for ever. I saw plainly that, if I remained, absolute silence, or a voice in favor of secession, must be the price of my personal-safety. This price was too great for me to pay. It would bankrupt my self-respect, and pollute my conscience. The only alternative was flight; and so, leaving my books and furniture to the mercy of Mr. Benjamin's confiscation law, as expounded by himself, I took time by the forelock and crossed the Potomac at Williamsport after dark on the 9th of May, 1861."

the college of which he was president, and, as it flamed up and crumbled to ashes in the very faces of the youthful traitors who had defiantly flung it to the breeze, he broke forth into that heroic and prophetic utterance, worthy to live as long as our flag floats and the Union lasts, "Thus perish all efforts to dissolve this glorious Union!" and which, when the die was cast and the colors were officially hauled down to treason, led him to spurn all compromise with traitors and to withdraw himself from their midst. This glorious spirit and example of militant patriotism came, like an old time battle-call, to many a son of Lafayette, in those days of the nation's extremity, when enthusiasm was not unfashionable, and loyalty meant—fight.

Our Roll of Honor, perfected through the intelligent and untiring zeal of the Secretary of our Alumni Association, shows the names of two hundred and twelve graduates, non-graduates, and undergraduates, who served in the military and naval service of the United States during the late war.

This number includes only those who were mustered into the United States service, and consequently excludes all agents of the United States Christian or Sanitary Commissions, examining surgeons, provost

^{*} The Alumni of Lafayette, who served in the United States Christian Commission, were Messrs. Selden J. Coffin, N. J. Conklin, E. C. Cline, R. H. Davis, D. M. Heydrick, N. S. McFetridge, James A. McGowan, John Menaul, W. P. Montelius, Joseph J. Parks, Robert Scott, George L. Shearer, N. S.

marshal's employees, or citizen clerks, though we have high precedent for their admission to the Roll of Honor. Were these classes counted in, they would swell the aggregate far above its present figure.

Two hundred and forty-seven regular graduates of the college, who had not yet passed the military age, were living at the beginning of the war; of these sixty-five, or over twenty-six per cent., served in the army or navy of the Union. A careful comparison of the Rolls of Honor of the different colleges, as far as they could be obtained, places Lafayette, in this respect, in the van of all. The average per centage of the New England colleges is about twenty-three per cent., Yale leading them with twenty-five.

The statistics from the colleges in the Middle States show a smaller figure, probably not reaching twenty per cent. The Western colleges, it is believed, sent a larger proportion of their Alumni to the war, but the information from them is so indefinite as not to warrant any decided conclusion.

Lowrie, and Joseph A. Patterson, (who died of disease therein contracted, December, 1864). In the service of the United States Sanitary Commission were Messrs. S. W. Pomeroy, J. J. Parks, R. Scott, and W. H. James. In addition to these, the Hon. Wm. M. Francis, of New Wilmington, Pa., class of 1889, under commission of Gov. Curtin, acted as special Relief Agent for the State of Pennsylvania, visiting all the Pennsylvania troops in the field, both in the armies of the East and of the West and Southwest, without compensation, and often with exposure and danger.

* These estimates are founded on the "Rolls of Honor" of the Colleges, so far as they could be obtained, as well as on Prof. Tyler's estimate in his sup-

Enough however has been ascertained to give our Alma Mater a proud preëminence among the colleges of the land. Of non-graduates, who did not graduate at other colleges, eighty-five entered the service. Thirty classes have graduated from Lafayette, all of which are represented on the Roll of Honor, twenty-three of them by graduates. The classes of 1855 and 1860 sent half their graduating number to the war; the classes of 1859 and 1861 more than half.

The sons of Lafayette have served in one hundred and thirty-five different regiments from fourteen States. "From the coasts beneath the Eastern star, from the shores of Northern lakes and rivers, from the flowers of the prairies, and from the homes of the midway and the border, they came" to do battle for the Union.

In the classification according to rank, taking advantage of that wise and benevolent clause in the Army Bill whereby officers who served in the war for the Union are permitted to wear the uniform and bear the title of the highest rank, brevet or linear, attained by them, we find on our Roll of Honor, of General officers six, Colonels seven, Lieutenant-Colonels five, Majors eight, Surgeons and Assistant Surgeons twentynine, Chaplains fifteen, Captains twenty-three, Lieu-

plemental chapter No. II. to "Prayer for Colleges;" and on the "Annual Reports of the Society for the Promotion of Collegiate and Theological Education at the West," for the years 1861, 1862, 1864, 1865.

tenants twenty-three, Non-commissioned officers twenty-three, and Privates sixty-seven. And it should be remarked here, that all whose rank was unknown have been put down as privates; though further investigation will undoubtedly show that a considerable proportion of these held commissions. Of those who served in the navy we find one Lieutenant Commander, one Professor of Mathematics, one Paymaster, two Assistant Surgeons, and one Volunteer Lieutenant.

From which it appears that, out of the one hundred and eighty-seven Alumni and former students who served, one hundred and twenty, or sixty-four per cent., held commissions: and at least one-third of those who served as enlisted men, joined the "Three Months' Regiments" under the President's first call for troops, or rallied for the defence of the State against invasion. And surely the purity of their motives is above suspicion, who, with the tastes and habits of educated men, took upon themselves the burdens, dangers, and privations of the private soldier. And it is a matter of note too, and speaks well for the men whom Lafayette gave for the Union cause, that one-fourth of those, who at the close of their term of service held commissions, entered originally as privates. A notable instance of this is found in the case of Brigadier-General E. L. Campbell, who in April of 1861 entered the service as a private, and left it at the close of the war, Brevet

Brigadier-General and Judge Advocate General of the Army of the Potomac.

Among others of our graduates who held positions of great responsibility and importance are Colonel Ingham Coryell, who, as chief Quartermaster of the Department of the South, fitted out and transported the first expeditionary army against Charleston, using for their transportation a fleet of one hundred and thirty vessels. The expedition being unsuccessful, the whole command was re-embarked and returned to Hilton Head, without the loss of a dollar's worth of property for which the Quartermaster's Department was responsible. For this excellent service Colonel Coryell was complimented in General Orders.

Colonel Colt of the 26th New Jersey Volunteers, held the position of Inspector General of the Department of Washington. General J. L. Selfridge commanded the Red Star Division of the 20th Army Corps during Sherman's grand march. General George P. Ihrie was Aid-de-camp and Inspector General on the Staff of Lieutenant-General Grant. Lieutenant-Colonel N. Michler of the United States Engineers, was chief engineer of the Army of the Potomac. William W. Nassau, surgeon of the far-famed 2d Iowa, and afterward Medical Director of the 1st Division, 17th Army Corps, in August, 1861, inaugurated the system of

steamboat hospitals, which proved of such great value, especially on our Western waters.

We have on our Roll of Honor the names of fifteen Chaplains, and I cannot refrain from giving the experience of one of them, as illustrative of the style of ministration that tells among the soldiers. At the battle of Fredericksburg the fortunes of the day left a large number of wounded men belonging to the Pennsylvania Reserves between the contending lines of skirmishers. They lay there, poor fellows, from the afternoon of Saturday, and all through the long December night their agonizing cries were heard, as in hunger and thirst and cold, in the darkness and alone, they bled their lives away. All attempts to aid them seemed unavailing, for the rebel skirmishers remorselessly picked off all who went to their aid.

On Monday night, strict orders were issued against the lighting of fires along the line, and the officer detailed to enforce obedience, as he rode along, came upon a fire kindled in rear of the line, in a little hollow hidden by trees, and there he found a Chaplain, with his contraband servant, playing the good Samaritan to a group of poor wounded men, whom they had dragged from between the contending skirmish lines at the imminent risk of their lives. This practical application of gospel principles the men most thoroughly appreciated, and the result was that, on the return of

the division to camp, they built a huge log church for their plucky Chaplain who had stuck to them through the brunt of the fight, and had perilled his life for them; and, what was better, every man in the regiment made it a point of honor to attend service once on Sunday. As the officers told me, no one in the regiment had more influence with the men than their Chaplain, for they honored and loved him as a man, as well as respected him as their superior officer.

And therein lies the great secret of success in that most important and much abused office, which too many of our chaplains, good and earnest men though they might have been, failed to discover. That man was John J. Pomeroy, Chaplain of the Third Pennsylvania Reserves, and after its disbanding, by a unanimous call, Chaplain also of the 198th Pennsylvania, recruited by the officers of his first "charge."

But without drawing further on the many items of interest which the military records of our Alumni present, we pass to a brief notice of the part taken by our undergraduates during the war; and in making up the record on this subject we met at once with many difficulties. A strange air of mysterious romance seems to envelope the story of their doings and sufferings, who in the dark days of 1862 and 1863 left the classic shades of Alma Mater for the side-walks and board-piles of Harrisburg. It is ascertained with sufficient

accuracy, that on both those occasions nearly all the able-bodied students of Lafayette, actuated by a commendable zeal to

"Drive the foot of fierce Invasion From off the shores of Freedom,"

rushed, in true traditional style, to the railroad depot. Ah! tender hearts beat anxiously, and bright eyes were dimmed with tears, as these devoted bands rallied to the banners of the gallant Thirty-Eighth and the "Bloody Fifth." So general was this patriotic exodus in 1863, that the twenty-eighth Commencement of Lafayette was omitted. That year no baccalaureate eloquence woke the echoes of the old "First Church"; no flowers were gathered, nor garlands strung.

But here the record grows confused; here the mystery begins. Exactly where they went, what they did when they got there, how long they staid, and the manner of their returning, in the absence of official reports on the subject, has not been satisfactorily determined. At all events, though they brought back their banners without battle inscription, and with unbroken ranks stacked their stainless muskets in the College halls once more, this much they did—like the "New York Seventh"—they "proved their truth by their endeavor."

But some of our undergraduates, to whom the "emergency" meant during the war, unless sooner disabled, wore the army blue through many a toilsome march, and hard fought fight. Of these the records give us the names of twenty.

It now remains for us to speak of our dead, to whom it was given, in the generous ardor of their youth, or the calm strength of their manhood, to seal with their lives the faith and loyalty of their hearts. Now, when the stern purpose and fiery passion of the fight is over, and the blessed calm of victorious peace sinks deep into our souls, the memory of the nation's dead, who died worthily in the nation's need, grows more sweet and sacred to us year by year, as the turf and the flowers grow fuller and brighter over their graves. Each man becomes a hero, each grave a shrine, and with bated breath and bowed heads we stand within the solemn temple of their great sacrifice, and render them the homage which every patriot heart so deeply feels.

But with fuller hearts and tenderer thought come we to the presence of our dead, whom Alma Mater has given for God and the Fatherland; her sons and our brothers, whose bright young faces, beaming with free unselfish impulse and fresh enthusiasm, were so loved and familiar in the intimate concourse of the classrooms and college-halls, now dead:

"But with a death so noble,
That our sad hearts refuse to weep."

It is not within the scope of this address to dwell at length upon the lives, characters, and services of our fallen brothers. But the record of their names and death will wake in many a heart the tenderest, saddest recollections, as, to the dirge-like music of by-gone days, in solemn mute procession, our Hero Dead pass by.

Richard A. Oakford, one of our earliest students, Colonel of the 132d Pa., fell at the head of his regiment at Antietam—highest in rank, first in time, and oldest of the sons of Lafayette who fell in battle.

Sidney M. Layton, a student in the class of 1836, Captain in the 11th New Jersey Infantry, fell in a night attack before Petersburg, June 16th, 1864.

Horatio S. Howell, class of 1840, Chaplain of 90th Pa. Vols., shot at Gettysburg by a rebel sharpshooter, at his post among the wounded, with the sacred symbol of the Hospital above his head.

Walter Scott Briggs, class of 1852, Adjutant of the 27th Pa. Vols., also fell at Gettysburg, where his remains now rest in the National Cemetery.

Edward S. Carrell, class of 1861, Captain in the 9th New Jersey, at Fort Darling, Va., May 16th, 1864.

Five in all who fell in battle.

Two died of wounds received in action,

Robert M. Mann, of the class of 1862, Private in the 128th Pa., graduated in July, enlisted in August, wounded in September, in October dead!

R. S. Parker, class of 1861, Sergeant-Major of the 131st Pa., at Fredericksburg received the wound that

brought him quick promotion to a patriot's grave. Not long before, he wrote, "I have an object now; it seems as if I had not half-lived before; I have pledged my life to the cause." Thus he redeemed his pledge.

One fell a victim to guerilla murderers,

Robert M. McCormick, class of 1856, Captain in the 7th Pa. Cavalry, shot by Sue Munday's gang in Georgia.

John Motter Annan, class of 1862, Lieutenant in the 1st Battalion Maryland Cavalry, was accidentally shot in camp at Frederick, Maryland.

Seven died in service, stricken down by those fearful scourges that hang upon the skirts of armies, more deadly and malignant than foeman's shell or bullet. Not less honorably died they than those who fell in the battle's front.

Daniel J. Carey, a student in the class of 1837, died at Alexandria, Va., July 19th, 1864.

Joseph Castles, class of 1859, Lieutenant 7th Pa. Cavalry, at Mumfordsville, Ky., March 13th, 1862.

John R. Hilton, class of 1860, Assistant-Surgeon of the 15th New Jersey, at White Oak Church, Va., March 17th, 1863. He died prostrated by the same fearful epidemic, which for days and nights, with unwearied faithfulness he had fought from tent to tent among his men; and now, on the banks of the Delaware, in his own beautiful village of Belvidere, a freestone column,

erected by them, testifies to the love in which his comrades held him.

William H. Alexander, class of 1861, died at his home in Indiana, in 1862. Entering the service at the beginning of the war, as Sergeant in an Illinois regiment, he passed safely through the battles of Fort Donelson and Shiloh, to fall by the dread typhoid contracted on the banks of the Tennessee.

Luther Davis, Valedictorian of the class of 1861, on board transport, Aug. 20th, 1863. Distinguished preëminently as a Christian gentleman and scholar, to us who knew him, his life and his death are his best epitaph.

John H. Buckley, a member of the class of 1863, Private in the 129th Pa. Infantry, at Sharpsburg, Md., October 18th, 1862, and

Henry Budd Howell of the class of 1864, at Fairfax Seminary, January 10th, 1862.

Edward A. Barnet of the Navy, and

Isaiah Moore of the Army, for many years in service, died early in the war; but it is not known that they took any active part in the struggle.

There are doubtless many, who after having left the service, died of wounds therein contracted. The names of some of these have come to us, but it has not been thought best to enter them upon our Roll of Dead, till the facts are more definitely ascertained.

We have, then, the names of eighteen who died in the service of their country. These are our choicest treasures, their memories our purest inspiration, their deaths our most potent examples in all that pertains to loyalty and patriotism. In due time the storied marble shall record their names within the sheltering shadow of their Alma Mater. But not this shall be their grandest and most enduring monument; though with the mighty army of their fallen comrades they do rest from their labors, their works do follow them. Thanks to the God of Battles our dead have not died in vain.

Turn we then from the dead to the living, from the past to the future, from the desolating horrors of war to the bloodless victories of peace. The immediate results of the war, the grand political and social facts which it achieved, are of course our chief compensation for the fearful carnival of death and woe through which the nation has passed. Secession nullified; slavery dead; the war-power of our Republican form of government unmistakably proved; its stability established, even under the culminating shock of the President's assassination; the grandeur of our resources developed; and American grit triumphantly vindicated;—these are facts, graven for ever in the history of the world. Whatever may be our future, no strife of party, no chicanery of politics can rend them from the nation's past. They are ours for ever, for we have made them.

But with this assured and grander nationality; with these mighty throes of the nation's agony; with this deep upheaval of the very foundations of national, social, and individual life, comes a new and vigorous intellectual life, and the promise of the speedy coming of our golden age of literature and art, day of the prophet's vision and the poet's dream, when American genius and art shall utter our grander nationality in tones more sublime than any heard since Milton sung. For times of ardent patriotism, when men's minds and hearts beat in unison to high and holy self-devotion, have been, from all time, the forerunners of marked epochs in literature and art. And this influence is two-fold. The national and individual experience becomes at once the educator and the theme of national Our purer and stronger nationality will raise up to us a new race of orators, statesmen, and senators, · worthy of its spirit, which they will delight to expound and defend. This wondrous history, which we have written in the life-blood of our noblest and best, will give us in due time American historians, whose majestic periods shall hand down to future ages the story which their clear insight and impartial minds shall grasp. And what an inexhaustible treasure do we leave for American thought and utterance, of facts and suggestions, adventure and characteristics, plots, stratagems, and pathos, deeds of vengeful hate and constant love, calm undaunted faith, shrinking timorous unbelief, joy and woe, cringing cowardice and chivalric daring, fit food and inspiration for coming romance and poetry, tragedy and comedy, painting, sculpture, and music.

It cannot be that all this varied and intense experience will be without its fruits. These thoughts, and scenes, and feelings, burned into the national heart, will surely find glorious utterance in the glowing creations of genius and of art. Says one who wrote before the war: "The reasserted instincts of liberty and equality reappear in sublimer statues and pictures and buildings, in wider and deeper philosophies, in eloquence that commands broader auditories, in poetry that burns with more of the immortal fire." The genuine hero will get his story told, his acted music sung.

Such is a faint glimpse of that bright future in the • world of mind, which, if we hold our faith firm and our purpose pure, will one day be the nation's present.

It is true that things look dark and hard to some of us, but we must remember that the mountains hold the echoes of the thunder when the bolt has already fallen, and old ocean rolls his angry waves long after the fury of the storm has ceased. What we most need, and what alone will carry us through in safety, is intelligent, unswerving faith in the stability of our government, and in the destined unity of our whole country, under the guiding hand of Jehovah, who has wrought such wonders for us. For, by our faith we live and act. It is to coming time that we must look.

A new era is upon us. A mighty convulsion, stupendous beyond our present comprehension, has swept away in fire and smoke, the cherished creeds and prejudices and institutions of years. Let us thank God and take courage that, amid the wreck and ruin of the past, the solid structure of our nationality, grander and lovelier than ever before, still rears itself in calm proud strength.

Young Romance raised his dreamy eyes,
O'erhung with dainty locks of gold:
"Why smite," he asked in sad surprise,
"The fair, the old?"

Yet louder rung the strong one's stroke;
Yet nearer flashed his axe's gleam,
Shuddering, and sick at heart I woke,
As from a dream.

I looked,—aside the dust-cloud rolled,
The waster seemed the builder too,
Uprising from the ruined old,
I saw the new.

Twas but the ruin of the bad;
The wasting of the wrong and ill,
Whate'er of good the old time had
Was living still.

Calm grew the brow of him I feared;
The frown that awed me, passed away,
And left behind a smile, which cheered
Like breaking day.

The grass grew green on battle plains;
O'er swarded war-mounds grased the cow:
The slave stood forging from his chains
The spade and plough.

"Thus the gazers of the nations,
And the watchers of the skies,
Looking through the coming ages
Shall behold with joyful eyes,
On the fiery track of Freedom
Fall the mild baptismal rain,
And the ashes of old Evil
Feed the future's golden grain."

ROLL OF DEAD.

The following obituaries are presented for the most part as they were furnished by the classmates and friends of the deceased. In some cases it has been found necessary to remodel and abridge on account of limited space.

Sidney M. Layton, Class of 1886.

Captain Layton was a native of New Jersey, and in 1832, as one of Lafayette's earliest sons, joined the academical department. He did not graduate, but engaged in business in Newark, New Jersey, where he was a prominent local politician, and held various offices.

On the 10th of July, 1862, he was appointed 1st Lieutenant in the 11th New Jersey Volunteers, and proving himself a brave and efficient officer, was soon promoted to a Captainey.

On the night of June 16th, 1864, the Rebels made one of their fierce night attacks on our lines in front of Petersburg. In this attack Captain Layton was severely wounded, and though the attack was repulsed, in the darkness and confusion inevitably attending all night-fighting, he was not found till morning, when life had left him. He lay near the headquarters of Colonel, now Brevet Major-General McAllister, by whom he was buried with due honors in the cemetery of Petersburg. Captain Layton left a wife and children to mourn his loss.

Daniel J. Carey, CLASS OF 1887.

Born in Easton, May 5th, 1819. He entered the College of New Jersey at Princeton at an early age, but soon returned to Easton, and joined Lafayette College, then in its infancy. Leaving, however, before graduation, he engaged for a number of years in mercantile life, and then in teaching, in which profession he was employed at the outbreak of the rebellion. On the 16th day of April, 1861, he enlisted in Company C, 1st Pennsylvania Infantry, under Captain, afterward Lieutenant-Colonel, Armstrong. Upon the expiration of his term of service he joined the 57th Pennsylvania Infantry, in which he served two years, and reënlisted in the same regiment.

Shortly after this, being partially disabled by wounds, he was transferred to the 3d Regiment Veteran Reserve Corps. On the 19th of July, 1864, he died at Alexandria, Virginia, from typhoid fever, induced by his repeated wounds and long exposure and hardships.

Mr. Carey was three times wounded: at the battles of Fair Oaks, Williamsburg, and Fredericksburg. As a testimony of his standing with his comrades, it is significant that they united in embalming his body, and sending it home under an escort detailed by his commanding officer for that purpose.

The testimony of his officers is as follows: "He was an excellent and worthy soldier, always present and ready for duty." "I esteemed him very highly." "He was always faithful in the discharge of his duty. It is a pleasure to have such men under one's command. I wish all were like him."

Richard Adolphus Oakford, CLASS OF 1888.

Born December 6th, 1820, in Philadelphia. Early in life he lost his father, and was brought up by his mother, who still survives. He was a bright child, of quick perception, with considerable aptitude for study, cheerful, generous, and affectionate. He entered Lafayette College in 1833, and after one year's study was obliged to return to Philadelphia, where, after some time spent in preparation, he began the study of engineering under Enoch Lewis. He followed his profession in Bradford and Chester counties for some time, but not finding ready employment, he entered mercantile life as bookkeeper in a wholesale dry goods store. His health, however, being decidedly affected by the confinement, in 1841 he moved to the Wyoming Valley, where he married and settled down as a farmer, and held the office of Justice of the Peace. At the outbreak of the rebellion he was chosen Colonel of the 15th Pennsylvania Infantry, and at the expiration of his term of service he returned to the field as Colonel of the 132d Pennsylvania Infantry. But a few weeks after his appointment he was killed at Antietam while leading on his men. His remains were brought home and buried near the head of the Wyoming Valley. He is described as a man of much general information, affable in his manners, and as possessing the confidence and affection of his men.

Horatio S. Howell, CLASS OF 1889.

Born at Ewing, New Jersey, August 14th, 1820. Having prepared for college in a school at his native place, he entered Lafayette in 1835, but left for Princeton, New Jersey, after a year's study. At Princeton he spent over a year, but did not graduate, leaving to teach in Hartsville Seminary at Neshaminy, Bucks county, Pennsylvania. In 1842 he entered the Union Theological Seminary at New York, and in 1845 was licensed by the Third Presbytery of Philadelphia. Mr. Howell settled at East Whiteland, Chester county, Pennsylvania, and in 1846 was married to Miss Grant of New York. In 1849 he

was called to the charge of the adjoining congregations of Elkton, Maryland, and Pencader. Delaware. The churches growing under his ministry, he relinquished the latter and devoted his whole time to the Elkton church, where he remained till 1853, when, on account of the health of himself and family, he was obliged to leave, and settled at the Delaware Water Gap, Pennsylvania. Here Mr. Howell opened a boarding-school, and was at the same time pastor of the Presbyterian church at that place. About this time he received the honorary degree of Master of Arts from the College of New Jersey. At the outbreak of the rebellion Mr. Howell joined the 90th Pennsylvania Infantry as Chaplain, and served faithfully until his death at Gettysburg. On the 1st of July, after the 1st and 11th Corps had been driven from the town, leaving their wounded in the hands of the enemy, Mr. Howell was shot by a rebel soldier as he stood in the door of the building used as a hospital. A life-long friend describes him as "a man of devoted, uniform, aggressive piety, amiable disposition, a firm, unfaltering friend, possessing noble traits of character and universally beloved."

Walter Scott Briggs, CLASS OF 1852.

Born at Weymouth Iron Works, Atlantic county, New Jersey, September, 1836. Mr. Briggs was prepared for college by Rev. Samuel F. Colt at May's Landing, Atlantic county, New Jersey. He entered the class of 1852 in Lafayette College, but did not graduate. After some preparatory study, he entered the law office of Joshua Speering, Esq., of Philadelphia, where he remained till the breaking out of the rebellion. He enlisted in the 1st Delaware Infantry, where he served three months, and on being mustered out, joined the 27th Pennsylvania Infantry. In January, 1862, he was promoted to a Lieutenancy, and in September of the same year he was appointed Adjutant of the regiment, a position for which his business habits and talent admirably qualified him.

On the 2d of July, 1863, at Gettysburg, he led a part of his regiment against a body of rebel sharpshooters, and, as always conspicuous for his gallantry, fell, pierced by a rebel bullet. He was buried first in the old cemetery near where he fell, and afterward in the National Cemetery where he now lies. Adjutant Briggs was widely known as a brave and efficient officer.

Robert M. McCormick, Class of 1856.

Captain McCormick, son of Robert McCormick, of Milton, Pennsylvania, entered the Sophomore Class in 1853, and graduated in 1856. For two years after graduation he taught an academy at Lebanon, Pennsylvania, and then studied law with E. H. Baldy,, Esq. of Danville. After his admission to the Bar he settled in Ashland, Schuylkill county, where he practised successfully.

Soon after the beginning of the Rebellion he enlisted in the 7th Pennsylvania Cavalry, but was soon promoted to a Lieutenancy, and afterwards to a Captaincy. In the winter of 1863, while serving in Georgia, he, in company with another officer of the regiment, was spending the evening but a short distance from camp, when some of Sue Munday's notorious gang of Guerillas rushed in upon them and shot them both.

Captain McCormick was an extremely popular man, and had qualifications that would undoubtedly have raised him to a high position at the Bar.

Joseph Castles, Class or 1859.

Born in Juniata county, Pennsylvania, on the 20th day of May, 1836. His parents removed when he was young to Turbotville, Northumberland county, and at the neighboring Academy in McEwensville he prepared for College.

In September, 1856, at the age of twenty, he entered the Sophomore Class of Lafayette College, where he maintained a respectable stand as a student, and was popular both with his associates and instructors. Graduating in 1859, he assumed the charge of the Wayne county Normal School, at Prompton, for one year, when he left and taught another year at Dewart. In the meantime he had entered himself as a student of law at Milton, in the office of Ex-Governor Pollock, and made some progress while teaching and during his vacations.

In October, 1861, he joined the 7th Pennsylvania Cavalry as First Lieutenant, and was soon ordered to Kentucky. In the spring of 1862 he contracted a severe cold from exposure, which terminating in fever, ended his life March 18th, 1862. He died at Mumfordsville, Kentucky, at the house of a lady who nursed him with the utmost kindness. His remains were brought home for interment in the churchyard of Warrior Run, Northumberland county, Pennsylvania. "As a soldier," it was said of him, "he was heartily trusted by his men, and comprehended all the vital issues at stake in this struggle, and for which he laid down his life. On his death-bed, far from home and friends, he declared to those about him his dependence on his Saviour."

John Randolph Hilton, CLASS OF 1860,

Was born at Bloomsbury, New Jersey, May 4th, 1835, whence his father moved to Mendham, and, in the summer of 1850, to Belvidere, New Jersey.

Surgeon Hilton, being then in his fifteenth year, entered the Classical School of Rev. Robert Wells, in Belvidere, and subsequently completed his preparation for College under the charge of Rev. Frederick Knighton. He entered Lafayette in 1856, but did not graduate with his class, leaving College in 1858 to study medicine at the Jefferson Medical College, Philadelphia.

In the Fall of 1862, he joined the 15th New Jersey as Hospital Steward, and after a few months service was promoted to be Assistant-Surgeon of the regiment. In the Spring of 1863, at White Oak Church, Virginia, and vicinity, congestive fevers prevailed with fearful malignity among the troops there in winter quarters. Surgeon Hilton was indefatigable in his attentions to the men of his command, and in spite of remonstrance and warning, completely were himself out in taking care of the sick.

On the 15th of March he fell a ready victim to the fever, and on the 17th he died, lamented and beloved as a most valuable and able medical officer, and a warm and steadfast friend. His popularity was so great in his command that the officers and men joined in the erection of a monument to his memory at Belvidere, New Jersey, where his remains lie.

Edward S. Carrell, CLASS OF 1861.

Captain Carrell was the son of Rev. John J. Carrell of the Class of 1836, and was the first son of an alumnus of Lafayette College to matriculate at his father's Alma Mater. He was born at Uniontown, Warren county, New Jersey, August 11, 1841, but spent his earlier years in Livingston county, New York, and received his academic training at the Buffalo Synodical Academy at Geneseo. He entered the Class of 1861, and took a good stand as to scholarship, and was soon by his liveliness and engaging manners deservedly popular with all.

He did not graduate, but left College to enter the law-office of Hon. H. D. Maxwell, Easton, Pennsylvania, where he remained until the outbreak of the rebellion. Judge Maxwell thus speaks of him: "I shall ever retain in cherished recollection the pleasant intercourse between your noble and lamented son and myself. Possessed of pleasing manners, quick and clear intellect, and studious habits, he was a general favorite, and gave promise of decided success in his chosen profession. But with him patriotism was above self or self-interest. When the news of the attack on Fort Sumpter came he was powerfully excited, and was among the first to volunteer his services in behalf of our beloved Republic. . . . I loved him well, was proud of his success, and deeply mourned his early loss."

Captain Carrell served as a non-commissioned officer in the 1st Pennsylvania Infantry for three months, and after its disbanding enlisted in the 9th New Jersey Infantry. In February of 1862 he was appointed Color-Sergeant; in March was commissioned Second Lieutenant; in April assumed the duties of Regimental Quarter-Master; in December was promoted to a First Lieutenancy and appointed Adjutant, which position he filled at the time of his death; though early in May, 1864, he was commissioned Captain, his value as an Ad-

jutant was so great, that, at the earnest solicitation of his commanding officer, he consented to continue to act in that capacity.

In May, 1864, the 9th New Jersey was hotly engaged in the battle before Fort Darling, in which the uncle of Captain Carrell, General Heckman, was taken prisoner.

From this fierce fight the subject of our sketch never came alive. His fate remains unknown; but after months of anxious waiting and sad solicitude, hope finally fled, and the stricken parents and anxious friends acquiesced in the general belief that their "missing" loved one filled another of those many graves in the Old Dominion whose headboards bear the sad inscription, "An Unknown Union Soldier."

Luther Davis, CLASS OF 1861.

Born in Elizabeth, New Jersey. He entered the preparatory school of Mr. Nultman of his native place, where he remained until the removal of his family to Phillipsburg, when he entered Lafayette College. More than most young men Mr. Davis received the respect of his teachers and associates.

His college life presented a rare combination of dignity and humility, sobriety and geniality, consistent Christian deportment, and thorough kindly interest and sympathy for all with whom he was associated. He graduated in 1861 at the head of his class, though only eighteen years of age.

One year after his graduation he spent in teaching, and then enlisted in the 9th New Jersey Infantry. The Colonel commanding his regiment soon chose him as Head-quarter's Clerk, which position however did not prevent him participating in all the engagements in which his regiment was concerned. In the summer of 1868 his health failed him, and, obtaining a furlough, he sailed from Newbern, where he was stationed, for home. His disease however increased, and on the 20th of August, 1863, he died on board the transport Dudley Buck.

His Colonel, afterwards General Heckman, said of him, "He is a high-toned honorable gentleman, a true and faithful soldier of the Union, and, as far as mortal man can judge, a consistent Christian. I hold him in high esteem. He has at all times done his whole duty, and proved himself a brave and gallant soldier."

Surgeon A. W. Woodhull of his regiment, who was with him at the time of his death, says of him, "He was always the same—meek in disposition, powerful in faith; though young in years, a veteran Christian." His last message to his parents was, "Tell them I died firm in the faith they have taught me."

Roswell Southard Parker, Class or 1861.

Born in Lewistown, Pennsylvania, November 26th, 1887. He was prepared for college in the Academy of his native place, and entered the Sophomore

class of Lafayette College in 1858. Graduating regularly in 1862, he entered the office of his brother, in Lewistown, as a student of law. In August, 1862, he enlisted in the 131st Pennsylvania Infantry, and was appointed Sergeant-Major of the regiment. He was commissioned 1st Lieutenant by Governor Curtin in November, but his commission did not reach him till after the battle of Fredericksburg, where he received his mortal wound. A Minie-ball entered the leg below the knee, and was taken out below the ankle. It was supposed to be only a flesh wound, and at first no serious consequences were apprehended. But lock-jaw and fever set in, and on the 19th of January, 1863, he died at the house of his friend, Captain Frank, at Washington, D. C. He was buried in the cemetery at his native place. Mr. Parker was possessed of a clear strong mind, and of a peculiarly happy and generous disposition. He entered into the war with an intensity of purpose and firmness of faith that surprised even those who knew him best. His death was peaceful and happy.

John Motter Annan, Class of 1862.

Born in Emmitsburg, Maryland, March 17th, 1841. Prepared for college in his native town, Mr. Annan entered the class of 1862 in Lafayette College. The time that he spent at college was well spent in conscientious attention to duty. He had a maturity of purpose and principle beyond his years, and without assuming authority or leadership, was greatly trusted and looked up to by his fellow-students. Feeling it his duty to go to the defense of his native State, in August, 1861, at the beginning of his Senior year, he enlisted with his brother in a local company of cavalry, which was immediately ordered into active service, and afterwards became the 1st Regiment Maryland Cavalry, known better as "Cole's Cavalry." Mr. Annan was elected Lieutenant of his Company, "C," but was not permitted to serve long with it, for on the 14th of November, 1861, he was killed by the accidental discharge of a carbine in camp at Frederick, Maryland. Mr. Annan was a sincere and consistent Christian both in his college and army life. At his death the following resolution was passed by the men of his command:

"Resolved. That we, as a company, regret the loss of one who was so exemplary in his conduct, and who was ever ready to say a kind word, and do a kind act for the members of his command."

Robert M. Mann, Class of 1862.

Born near Doylestown, Bucks county, Pennsylvania, September 12th, 1842. During his preparatory education at the academy of Mr. Shumaker, Academia, Juniata county, Pennsylvania, he was characterized as a diligent and successful student, entering with ardor into everything which he undertook. In September, 1859, he entered the Sophomore class of Lafayette College,

graduating in 1862. During his entire college course Mr. Mann was distinguished for his diligence in study, and his moral and gentlemanly deportment. Only ten days after his graduation, in company with several college friends from his vicinity, he enlisted in the 128th Pennsylvania Infantry, and was immediately ushered into active service with the Army of the Potomac. On the 17th of September, at Antietam, he received a gun-shot wound in his shoulder, which terminated in his death, October 28d, scarcely three months from his graduation. He died in hospital at Philadelphia, and was buried at Doylestown. Of his religious experience his pastor, who was with him at his death, says: "Though desponding in the earlier days of his suffering, this darkness at length gave way to the dawning light which increased to the fulness of perfect day as his eyes were closed in death."

John Hecht Buckley, CLASS OF 1863.

Eldest son of Mr. Lewis A. Buckley, was born in Easton, Pennsylvania, March 6th, 1842. After having received the instruction of a number of preparatory schools, he entered the Easton High-school, whence he graduated in 1858, to enter Lafayette College. Mr. Buckley spent several years in college, but had not graduated when the war broke out. His conscientious conviction of duty led him to volunteer in the 129th Pennsylvania Infantry in August, 1862. He was not permitted to serve his country long, however, for on the 18th of October, after an illness of about three weeks, he died of typhoid fever at Sharpsburg, Maryland. His parents and several friends were with him at his death, and testify to his Christian resignation. His remains were brought home and interred in the Easton cemetery. Mr. Buckley was distinguished for his conscientiousness, his humility, and gentleness. He was cheerful and even gay in his disposition. The fine arts, especially music, were his chief delight, and both as a composer and performer he excelled. His accomplishments, together with his gentlemanly deportment and kindly nature, rendered him universally popular, and there are few names in his native town held in more general and regretful remembrance than the name of John H. Buckley.

Henry Budd Howell, CLASS OF 1864.

Born May 2d, 1840, in Northampton county, Pennsylvania. He entered the Freshman Class in the year 1860, and remained a student of Lafayette until he entered the army. He enlisted in the 1st New York Volunteer (Lincoln) Cavalry, September 11th, 1861; and proceeded immediately to join his regiment, then at the front. He continued in active service, until a heavy cold, contracted by exposure while on active duty, resulted in a fatal attack of typhoid fever. He died, after an illness of two weeks, at Fairfax Seminary, Virginia, January 10th, 1862, aged twenty-one years seven months and eight

days. His body was brought to Easton for interment. Resolutions expressing their sorrow at his death, and their sympathy with the bereaved family, were passed by the Washington Literary Society, of which he was an earnest and devoted member. He was a member of the First Presbyterian Church of Easton, a sincere Christian, and died rejoicing in the confident hope of a glorious resurrection. Modest, unassuming, and courteous, he was beloved by all his associates. His talents, his close application and eagerness in the pursuit of knowledge, promised a future of eminence and distinction. But, at the call of his country, he relinquished those studies, so congenial to his mind, and endured without murmuring the hardships of a soldier's life, and crowned the sacrifice by yielding up his own life, that his country might continue to live.

ROLL OF HONOR.

This list includes the names of Graduates, Non-graduates, and Undergraduates known to have been mustered into the military or naval service of the United States during the late war.

The names of the Non-graduates are enclosed in brackets and placed under the list of Graduates in the several classes.

The names of the dead are marked with a star, and the time and place of their death printed in italics.

CLASS OF 1886.

[Carrell, John J., Chaplain 9th New Jersey Infantry.

*Layton, Sidney M., Captain 11th New Jersey Infantry. Before Petersburg, Virginia, June 16th, 1864.

CLASS OF 1887.

[*Carey, Daniel J., Private 1st and 57th Pennsylvania Infantry, and 3d V. R. C. Alexandria, Virginia, July 19th, 1864.]

CLASS OF 1888.

[Davidson, Delozier, Lieutenant United States Army.

*Oakford, R. A., Colonel 15th and 182d Pennsylvania Infantry. Antietam, Maryland, September 17th, 1862.]

CLASS OF 1889.

[*Barnet, Edward A., Lieutenant Commander (?) United States Navy. Philadelphia, 1864.

Colt, Samuel F., Chaplain 96th Pennsylvania Infantry.

Coryell, Ingham, Captain and Brevet Lieutenant-Colonel A. Q. M. U. S. V., Chief Quarter-Master Department of the South.

*Fowler, Samuel, Colonel 15th New Jersey Infantry. (Died while member of New Jersey Senate, January 14th, 1865.)

*Howell, H. S., Chaplain 90th Pennsylvania Infantry. Gettysburg, Pennsylvania, July 1st, 1868.]

CLASS OF 1840.

Dorris, William, Colonel 8d Pennsylvania Militia.

[Cummins, F. M., Colonel 124th New York Infantry, Captain 1st Iowa Infantry, Captain 1st U. S. Infantry Mexican War. Wounded at Wilderness-]

CLASS OF 1841.

[Junkin, John M., (Miami University), Surgeon 56th and 64th Pennsylvania Infantry, Assistant-Surgeon 9th Pennsylvania Cavalry.

Marr, W. H., Assistant-Surgeon 185th Pennsylvania Infantry.]

CLASS OF 1842.

[Sandt, Samuel, Assistant-Surgeon 85th Pennsylvania Infantry.]

CLASS OF 1848.

*Merrill, Charles, Private 51st Pa. Infantry. (Died December 25th, 1865.) Yardley, M., Captain and Provost Marshal United States Volunteers, Lieutenaut 104th Pennsylvania Infantry.

[Browne, R. B., Surgeon U. S. Vol., Surgeon 80th New Jersey Infantry.

Davis W. L., Lieutenant 5th Pennsylvania Militia.

Hixson, Theodore, Private 51st Pennsylvania Infantry.

Junkin, James G., Assistant-Surgeon 5th Ohio Infantry.

Porter, Andrew, Brig. Gen. U. S. Vol., Col. U. S. Infantry, (West Point.)]

CLASS OF 1844.

[Beach, G. W., Captain A. Q. M. United States Volunteers.

Eakins, D. W., (College of New Jersey), Chaplain United States Army.

McNair, W. W., (College of New Jersey,) Chaplain 1st New York Cavalry.

Overton, Giles B., Captain 14th United States Infantry.]

CLASS OF 1845.

Stephens, W. M., Surgeon. In charge of Hospital at Vicksburg.

[Longnecker, H. C., Colonel 9th Pennsylvania Infantry.

Michler N., Major and Brevet Lieutenant-Colonel Corps of Engineers U. S. Army, Chief Engineer Army of Potomac, (West Point.)]

CLASS OF 1846.

Chapman, C. I. A., 1st Lieutenant, R. Q. M. 181st Pennsylvania Infantry. Hulsiser, A. C.

[Carrell, Uriah W., Private and Lieutenant 2d D. C. Infantry, Private and Captain 5th U. S. Veteran Volunteer Infantry.

Pottinger, C. B., Acting Volunteer Lieutenant United States Navy.

Selfridge, J. L., Col. 46th Pennsylvania Infantry, Brevet Brigadier-General U. S. Vols., Commanding 1st Division 20 A. C.]

CLASS OF 1847.

Noble, W. F. P., Chaplain 29th Pa. Infantry, Post-Chaplain U. S. Army. [Cook, Joseph S., (Union College), Assistant-Surgeon 30th N. J. Infantry. Ihrie, G. P., Brevet Brig. Gen. U. S. Vols., A. D. C. and I. G. on Staff of

General Grant, Paymaster U. S. Army.

Moore, De W. C., Captain 40th Pa. Infantry, Colonel on Gov. Curtin's Staff. Titus, U. B., 1st Lieutenant, R. Q. M. 21st New Jersey Infantry, Captain and Ordnance Officer, Staff of General Mott.

Tully, David, (Union College), Chaplain 77th New York Infantry.]

CLASS OF 1848.

Armstrong, Hallock, Chaplain 50th Pennsylvania Infantry.

[Kennedy, Alfred, Captain 8th Missouri Cavalry.

*Moore, Isaiah, Captain Cavalry U. S. Army. Died 1861 in the far West.]

CLASS OF 1849.

Melick, P. W., Chaplain 158d Pennsylvania Infantry.

[Bossert, H. M., Colonel 137th Pa. Infantry, Captain 11th Pa. Infantry.

Colt, T. A., Lieutenant-Colonel 25th New Jersey Infantry, Inspector-General Head-Quarters Department of Washington.

Godown, J. M., (Washington College, Va.), 1st Lieutenant 12th Indiana Infantry. Prisoner of war at Charleston.

Hoyt, H. M., (Williams College), Colonel 52d Pennsylvania, and Brevet Brigadier-General U. S. Vols. Prisoner of war at Charleston.

Merrill, George, Major and Judge Advocate U. S. V., Staff of Gen. L. Merrill.

Petriken, R. B., Major 5th Pennsylvania Infantry.

Reiley, James, (Union College), Surgeon 24th and 31st N. Jersey Infantry.

Vincent, J. H., Lieutenant 151st Pennsylvania Infantry.

Wolverton, J., Surgeon U. S. V. 2d Corps Hosp. (White House, Va.)]

CLASS OF 1850.

Nassau, W. W., Assistant Surgeon 2d Iowa Infantry, Surgeon U. S. Vols., Surgeon-in-Chief 1st Division 17th A. C.

[Heberton, Ed. P., (College of New Jersey), 1st Lieutenant, Assistant Paymaster United States Navy. Wounded at Roanoke Island.

*Neff, Aldus J., (College of New Jersey), Captain 30th Pennsylvania Infantry, (1st Reserves). Seven Days Fight, Va., August 4th, 1862.

Sharpe, W. R., (Washington College, Va.), Surgeon 15th N. Jersey Infantry, Surgeon-in-Chief 1st Division 6th A. C., Assistant-Surgeon 6th N. J. Infantry. Sloan, Thomas, Colonel 124th Illinois Infantry.

CLASS OF 1851.

Love, J. J. H., Surgeon 18th N. J. Inf., Surgeon-in-Chief 1st Div. 12th A. C. [Dickson, William J., Surgeon Indiana Infantry.]

CLASS OF 1852.

Johnston, W. S., Adjutant 47th Pennsylvania, Captain - Pa. Infantry.

McKeen, T. L., Major 88th Pennsylvania Militia.

[Abernethy, R. H., Private 5th Pennsylvania Militia.

*Briggs, W. S., Adjutant 27th Pennsylvania Infantry, and Private 1st Delaware Infantry. Gettysburg, Pa., July 1st, 1863.

Horner, Ed. H., (Union College), Surgeon 127th Pennsylvania Infantry.

Wagner, George W., Private 47th Pennsylvania Infantry.]

CLASS OF 1858.

Andrews, Wm. P., Private Battery "D" Pa. Artillery, (Independent.)

[Hart, Israel, Assistant Surgeon 85th New Jersey Infantry.

McKeen, Wm. M., Lieutenant 118th Pa. Infantry. Wounded at Antietam. *Porter, A. P., (West Point), Lieutenant Colonel, Com. of Subsistence U. S. A. Chief Commissary Army of Potomac. *Died August* 15, 1866.

Semple, J. E., Surgeon U. S. Army. In charge of Hospitals at Hilton Head and Fort Vancouver.

CLASS OF 1854.

Neff, W. L., Captain 8d Pennsylvania Infantry. [Koons, John.

Rodenbough, T. F., Captain and Brevet Lieut. Col. 2d U. S. Cavalry, Colonel 18th Pa. Cavalry, Brevet Brig.-Gen. U. S. V. Wounded at Cedar Creek, Va.]

CLASS OF 1855.

Allen, B. P., Sergeant 11th Pa. Infantry, Adjutant 5th Pa. Militia. Allison, W. M., Quarter-Master Sergeant 126th Pa. Infantry.

Apple, C. A., Major 9th Pa. Cavalry. (Prisoner of war in "Libby Prison.")
Campbell, E. L., Colonel 4th New Jersey Infantry, Brevet Brig.-Gen. U. S. V.,
Judge Advocate General Army of Potomac.

Chandler W., Lieutenant 21st Pennsylvania Cavalry. (Prisoner of war in "Libby Prison.")

Wikoff, C. A., Captain and Brevet Major 15th United States Infantry. (Wounded at Shiloh.)

[Pollock, T. C., Assistant-Surgeon 171st Pennsylvania Infantry].

CLASS OF 1856.

Hamburger, Herman, Captain 18th Pennsylvania Cavalry.

Hopkins, W. W., 1st Lieutenant 79th Pennsylvania Infantry.

Kerr, H. D. T., Corporal 7th New York State Militia.

Logan, S. G., Private — Delaware Infantry.

*McCormick, R. M., Captain 7th Pennsylvania Cavalry. Murdered by Guerillas in Georgia in Winter of 1863.

Reidy, Owen, Chaplain United States Colored Troops.

[McCormick, T. Hood, Captain 4th United States Cavalry.]

CLASS OF 1857.

Cline, E. C., Chaplain 11th New Jersey Infantry.

Craft, David, Chaplain 141st Pennsylvania Infantry.

Kennedy, W., Private 126th Pennsylvania Infantry.

Pomeroy, J. J., Chaplain 8d Pa. Reserves and 198th Pa. Infantry.

Roller, W. C., Surgeon 23d Pa. Infantry, Assistant-Surg. 8d Pa. Infantry.

Wilhelm, J. C., Chaplain 45th U. S. C. T., Private 208d Pa. Infantry.

[Apple, S. A., Sergeant 51st Pennsylvania Infantry.

Findley, Jos. R., Captain 76th Pa. Infantry, Private 19th Pa. Infantry.]

CLASS OF 1858.

Baldwin, N. A., Surgeon 178d New York Infantry.

Du Bois, F. L., Assistant Surgeon United States Navy.

Hayes, Edgar W., Private 7th Pennsylvania Reserves.

Miller, J. A., Assistant-Surgeon 2d Rhode Island Infantry.

Slough, G. B., Assistant-Surgeon United States Navy.

[Burke, J. R., 1st Sergeant 15th Pennsylvania Cavalry, (Anderson Troop.) Cooper, Milo, Private.

Harkness, W., (Rochester University), Lieut. Com. U. S. Navy, Professor of Mathematics U. S. N. Observatorv.

Long, Hiram, Surgeon 205th Pa., and Assistant-Surgeon 178d Pa. Infantry.]

CLASS OF 1859.

Boyd, James P., Private Pennsylvania Militia.

*Castles, Joseph, 1st Lieutenant 7th Pennsylvania Cavalry. Mumfordsville, Kentucky, March 13th, 1862.

Dentler, H. C., Lieutenant Pennsylvania Infantry, Aid-de-Camp to Gen.

—, 1st Sergeant 4th New York Artillery.

Ferriday, W. C., Chaplain 121st Pennsylvania Infantry.

Hayes, Jos. H., Surgeon 90th Pennsylvania Infantry.

Hetrich, F. D., Lieutenant 9th Pennsylvania Infantry.

*Stothoff, H., Private 3d New Jersey Infantry. Died May 1862.

Watson, H. C., Private 125th Pennsylvania Infantry.

Weaver, J. W., Private 5th and 38th Pennsylvania Militia.

[Fisher, William F., Assistant-Surgeon 50th United States C. T.

Robison, J. B., Captain 85th Pa. Infantry. Prisoner at "Libby."

Watson, William, Surgeon 145th Pennsylvania Infantry.]

CLASS OF 1860.

Benedict, A., Private 6th Michigan Infantry.

Blythe, S. G., Captain 1st New Jersey Infantry. (Twice wounded.)

Galt, S. P., Captain 122d Pennsylvania Infantry.

Lee, H. T., Major 4th N. Y. Artillery, Aid-de-Camp to Maj.-Gen. Doubleday.

Patton, J. B., Lieutenant, Reg. Quarter-Master 2d Pennsylvania Militia.

[Eilenberger, I. S., Private 5th Pennsylvania Militia.

*Hilton, J. R., Assistant-Surgeon 15th New Jersey Infantry. White Oak Church, Virginia, March 17th, 1863.

Kennedy, Edward T., Captain 11th New Jersey Infantry. Wounded.

Lounsbery, S. S., Surgeon 155th New York Infantry.

Moon, W. W., Private 88th Pennsylvania Militia.

Parker, R. M., Lieutenant 5th Mass. Cavalry, Private in "California 100."]

CLASS OF 1861.

Baldwin, F. A. R., Private 5th Pennsylvania Militia.

*Davis, Luther, Private 9th New Jersey Infantry, Regimental Clerk. On Transport, off Cape Hatteras, August 20th, 1863.

Hetrich, H. R., Lieutenant 196th, and Corporal 129th Pennsylvania Infantry.

McCamant, Thomas, Lieutenant 125th Pennsylvania Infantry.

Neal, C. W., 1st Lieutenant, and Reg. Quarter-Master 182d Pa. Infantry.

*Parker, R. S., Sergeant-Major 181st Pennsylvania Infantry. Washington, D. C., Jan. 10, 1863. Wounded at Fredericksburg, Dec. 12, 1862.

Person, Jacob, Private 38th Pennsylvania Militia.

Pomeroy, S. W., 1st Sergeant 126th Pennsylvania Infantry.

[*Alexander, William H., Sergeant 4th Illinois Cavalry. Vincennes, Indiana, 1862, typhoid fever.

Annan, A. A., Sergeant 8d Maryland Cavalry, (Cole's Cavalry.)

Bergstresser, P. S., Captain 192d Pennsylvania Infantry, and Reg. Quarter-Master 177th Pennsylvania Infantry.

*Carrell, Edward S., Captain 9th New Jersey Infantry. Fort Darling, before Richmond, Virginia, May 16th, 1864.

Seip, William H., Major and Brevet Lieutenant-Colonel United States Colored Cavalry, Captain 11th Pennsylvania Cavalry.

CLASS OF 1862.

*Mann, R. M., Private 128th Pennsylvania Infantry. Philadelphia, October 23d, 1863, from wounds received at Antietam.

Meigs, W. G., Sergeant 121st Pennsylvania Infantry.

[*Annan, John M., Lieutenant 1st Battalion Maryland Cavalry. Accidentally shot at Frederick, Maryland, November 18th, 1861.

Chandler, J., Quarter-Master-Sergeant 2d New Jersey Cavalry and 174th Pennsylvania Militia, 1st Lieutenant, Reg. Quarter-Master 2d N. J. Cavalry. ' Irwin, D. A., Captain 12th Pennsylvania Cavalry.

Seip, A. N., Lieutenant and Brevet-Major Signal Corps United States Army, Captain 2d Pennsylvania Cavalry.

Walker, D. S., Major and Assistant Adjutant-General U. S. Volunteers.]

CLASS OF 1863.

Brown, Wm. D., Private 5th and 88th Pennsylvania Militia.

Smith, W. P., Corporal 32d Battalion Pennsylvania Militia.

Young, J. E., Private 5th Pennsylvania Militia.

[Agnew, H. D., Hospital Steward 154th Pennsylvania Infantry.

Andrews, R. P., Corporal 128th Pennsylvania Infantry.

*Buckley, J. H., Private 129th Pennsylvania Infantry. Sharpsburg, Maryland, October 18th, 1862.

Craig, Robert, Cadet, Military Academy, West Point.

Hayes, Thomas R.

Leaman, Brainerd, Assistant-Surgeon 47th Pennsylvania Militia.

Rex, O. P., Assistant-Surgeon 38d Illinois Infantry. ("Normal" Regiment.) Stewart, Clement, (College of New Jersey), Private 38th Pa. Militia.]

CLASS OF 1864.

Appleby, J. F. R., Private 88th Pennsylvania Militia.

Bunstein, H. L., Private 88th Pennsylvania Militia.

Chidsey, C. F., Lieutenant 38th Pa. Militia, Private 129th Pa. Infantry.

Grier, John B., Private 88th Pennsylvania Militia.

Hays, S. W., Lieutenant 178th Pa. Infantry, Private 18th Pa. Cavalry.

Jamison, Robert, Private 129th Pennsylvania Infantry.

Reid, A. P., Private 38th Pennsylvania Militia.

[*Howell, H. B., Private 1st New York Cavalry. Fairfax Seminary Hospital, January 10th, 1862.

Richards, J. C., Assistant-Surgeon, in charge of Hospital, Mobile, Alabama, Private 129th Pennsylvania Infantry.

Risk, W. H., Private 11th Pa. Militia, (3 mos.) Sergeant 37th Pa. Militia. Van Doren, William P. C., Private 31st New Jersey Infantry.

CLASS OF 1865.

Adams, J. B. W., Private 5th and 88th Pennsylvania Militia.

Aiken, T. J., Private 5th Pennsylvania Militia.

Godshalk, A. S., Corporal 38th and 5th Pennsylvania Militia.

Hand, L. P., Private 88th Pennsylvania Militia.

Heberton, W. W., Corporal 194th Pennsylvania Infantry,

McGowan, J. A., Drummer 88th and 5th Pennsylvania Militia.

McLean, W. S., Private 5th Pennsylvania Militia.

Meigs, George D., Private 26th Pennsylvania Militia.

Menaul, John, Private 5th Pennsylvania Militia.

[Biddle, E. M., - Pennsylvania Militia.

McLeod, T., (Union College), Private 38th and 5th Pennsylvania Militia and — New York Infantry.

Notson, C. B., (Union College), Private 38th Pennsylvania Militia.]

CLASS OF 1866.

Clyde, J. C., Private 72d Illinois Infantry, Provost Marshal, Columbus, Kv.

Keller, G. T., Private 5th Pennsylvania Militia.

Wood, J. Whitfield, Private 88th Pennsylvania Militia.

[*Edinger, D. S., Private "Miller's Battery," Pennsylvania Artillery, and 29th Pennsylvania Militia. Died Dec. 1, 1865, by railroad accident.

Yelverton, Thomas, (Union College) Private 88th Pennsylvania Militia.]

CLASS OF 1867.

(In the list of this and the following classes, the names of those undergraduates who entered college since the expiration of their term of service, are enclosed in brackets.)

Smith, R. H., Corporal 194th Pennsylvania Infantry.

Stewart, Jas. W., Private 194th Pennsylvania Infantry.

[Heany, E. S., Corporal 185th Pennsylvania Infantry.

Hess, R. J., Private "Miller's Battery," Pennsylvania Artillery.

Kase, J. H., Private 18th Pennsylvania Militia.

Knipe, S. W., Private 2d Pennsylvania Militia.

McFarlane, W. R., Private 195th Pennsylvania Militia.]

CLASS OF 1868.

[Garber, A. P., Private 195th Pa. Infantry and 47th Pa. Militia.

Howell, A. B., Sergeant 1st New York Cavalry (wounded at Millwood, Va.)

McDowell, Albert, Lieutenant 178th Pennsylvania Infantry.

Stewart, W. G., Corporal Independent Company Pa. Militia (three months.) Young, J. B., Captain 84th Pennsylvania Infantry.]

CLASS OF 1869.

[Beisel, W. F., Private 26th Pennsylvania Militia.

Fulton, A. C., Private Pennsylvania Militia.

Grosh, A. B., Private 9th Pennsylvania Cavalry.

Heinen, M. E., Private 28th Pennsylvania Militia.

Jones, G. E., Sergeant 126th and 149th Pennsylvania Infantry.

Lawson, J. S., Private 28th Pennsylvania Militia.

Russell, A. M., Private 18th Pennsylvania Militia.

Scott, W. Q., Hospital-Steward 4th Iowa Cavalry.]

CLASS OF 1870.

[Brensinger, J. H., Private 97th and 124th Pennsylvania Infantry (wounded in front of Petersburg).

Canfield, C. K., Private 141st Pennsylvania Infantry (wounded at Chancellorsville).

Gemmill, William, Lieutenant 148th Pennsylvania Infantry (wounded at Chancellorsville).

Jacobson, T., Sergeant 5th New York Artillery.

Moody, N. P., Sergeant 141st Pennsylvania Infantry.]

SUMMARY.

	Living	Died in service.	Aggregate.
Graduates,	79	5	84
Non-Graduates,	89	14	108
Under-Graduates,	25		25
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	Total, 198	19	212

THE EGYPTIAN PRINCE

And Hebrew Lawgiver.

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THE

EGYPTIAN PRINCE;

AND

Hebrew Lawgiver.

DELIVERED BEFORE THE

Titerary Societies of La Fayette College.

EASTON, PENNSYLVANIA.

Sommencement of 1867.

By J. MORRISON HARRIS.

BALTIMORE:

PRINTED BY JOHN MURPHY & Co.

182 BALTIMORE STREET.

1868.

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LA FAYETTE COLLEGE,

September, 1867.

DEAR SIR :

At the first regular meeting of the present College year, the Franklin Literary Society unanimously adopted the following resolution:

"Resolved, That we avail ourselves of the first opportunity as a body, to thank the Hon. J. Morrison Harris, for his eloquent and instructive Address delivered before the Literary Societies of the College, at the late Commencement; and unite in earnestly requesting its Author to place the manuscript in our hands for publication."

As the Committee appointed to execute the design of this resolution, we beg to express in behalf of the Society, which recalls with pleasure, your membership when a student, its earnest desire that you will grant the request of the resolution.

We are, Very Respectfully,

Your Ob't Servants.

WALTER Q. SCOTT, A. A. SMITH, LUCIEN W. DOTY.

To

Committee.

Hon. J. Morrison Harris,

Baltimore, Md.

To

Mesers. Walter Q. Scott,
A. A. Smith,
Lucien W. Doty,

Committee.

GENTLEMEN:

I am flattered by your kind opinion of my Address before the College Societies at your recent Commencement, and place it at your disposal as you request.

Since the time when a boy, I was for awhile a student at La Fayette, I have not revisited it, until the occasion of the late Commencement; and I cannot refrain from expressing the impression made upon me, by the results of the energy and ability that have so vitalized the College; crowned the beautiful plateau on which it stands, with splendid and appropriate buildings accessory to its purposes, and so wisely applied the munificent endowments of its liberal friends as to entitle it to rank with the best educational Institutions of the Country.

With my best wishes and respects,

I am, Gentlemen, Your Friend and Servant,

J. Morrison Harris.



ADDRESS.

As travellers who have long journeyed over desert and prairie, hail with pleasurable excitement, the mountain peaks that swelling above the horizon, break the dull uniformity of the plain; so we turn with curious and eager interest to those lofty and distinguished characters, who rise from time to time, against the horizon of history, massive and grand in the confessed superiority of their genius and achievements.

As the eye would weary of perpetual landscapes of unchanging softness and beauty, and the ear would tire of murmuring brooks and warbling birds, and only the gentler voices of material life; and the whole man grow enervate and sickly without the presence in nature of those mighty forces that rouse him to loftier contemplations, and energize and elevate him; so is it salutary for the moral and intellectual man, to turn at times from the interests peculiar to himself, to the great performances that impress the race, and the illustrious men, whose names survive the passing centuries, and live immortal in the memory of man.

To such a character, I ask your attention now. Ages have passed since he entered upon the scenes of his great action, and was laid in his mysterious grave; yet every important act and incident of his eventful life is as fresh in the knowledge of mankind to-day, as if contemporaneous, and through all the ages that are yet to come, must his record remain clear and permanent.

Linked with the history of a nation whose simple mention excites all that weird and facinating interest that attaches to remote antiquity; illustrious for its attainments in arts and sciences; splendid and luxurious in the appoinments of its public and domestic life; concentrating boundless wealth and intellectual supremacy, in Capitals whose marvellous and enduring architecture has outlived dynasties and races; dominating over subjugated millions by the valor of a great military array, and the irreversible decrees of a systematised and debasing superstition; it is preserved in the knowledge of to-day, largely by the sepulchral monuments of its own departed greatness, and its association in history, with his illustrious name.

Intimately allied also, with the changeful and momentous career of yet another people, whose recorded fortunes touch the highest point of earthly grandeur, and sound the profoundest depths of tragic suffering—whose monarchs received the sceptre of their wide dominions directly from the Divine Hand, and conscious instruments of the

Almighty, were splendid illustrations of his favor, or fearful monuments of his wrath-whose ancestral line flowed from ages so remote, that no light of revelation flashes across their solemn and mysterious darkness, except from the inspired pen of their own great historian—the sublime utterances of whose Prophets, stir the world's heart to-day, as when burning with the vehemence of immediate inspiration, they appalled the guilty with their crushing maledictions, or made the present trouble luminous with promises of coming glory; whose Bards exhausted every form of happiest utterance in songs of sacred praise, brilliant with images sublime and beautiful as midnight skies are lustrous with unnumbered stars. A people, whose whole career, signalized by miracles and marked by portents, sweeps downwards from the visible presence and favor of the Highest, through all possible mutations of change and suffering, and must continue to enlist our most pathetic interest, until the period of its marvellous and predicted consummation.

Full of interest to all, my subject should be specially valuable to you, young men, whose feet press the threshold, and whose gaze is turning with eagerness and hope to that future in which lie enfolded the august mysteries of life; for prominent in all its teachings of history and example, are developed the highest traits of personal

character, and the loftiest motives of human action; which while they cannot fail to arrest your attention, are eloquently suggestive of imitation in all the scenes of duty and trial that will mark your coming experience of life.

The "Daughter of Pharaoh," Queen of the great realm of Egypt, looks out from the terraced front of her palace, upon the scene of wonderful magnificence and beauty, that spreads before her. It is lighted by the golden glory into which the sun is fast descending, and through the medium of the transparent atmosphere, the most distant objects are brought distinctly to her view.

Over her bends with its changeless beauty, the deep blue sky of Egypt, whose reflected color tinges the tawny waves of the sacred river, that for four thousand miles has rolled from its undiscovered sources in the mountains or plains of Equatorial Africa; and which gay with countless vessels, bright with colored sails and silken streamers, and crowded with stately war ships, swept along with thousands of banked and flashing oars, flows on to the Mediterranean sea. intervals the light boats of the fisherman dot the river, and ever pass and repass vessels bound to Africa, Philistina, Colchis and Tyre, and as they skirt the river's bank, the monstrous crocodiles slide lazily into the turbid waters. Beyond the Nile, stretches the yellow and measureless desert,

broken in the distance by the range of the Arabian and Lybian hills, and the huge mass of the towering pyramid.

In striking and lovely contrast with this scene of desolate sterility, her eye dwells with rapture upon the broad belt of verdure and beauty that marks the overflow of the fecund and gracious For leagues stretches unbroken, the long line of gardens, villages and verdant fields, every acre teeming with population, and blooming like the rose. Vast fields of waving grain are interspersed with groves of shining myrtle, almond trees and sacred palms; while the air is loaded with the perfume of countless flowers, from whose setting of green and purple, rise temples, towers, obelisks and stately palaces with terraced gardens sloping to the river's edge. To the westward is seen Jizeh with its lofty amphitheatre; yet further on lies Memphis with its great acqueduct, and towering over all in solemn grandeur, the Pyramid of Cheops. Nearer shine the great Temple of Athor, the obelisks and towers of Ramesis, the treasure city; and dominating over all, the central and engrossing object in this scene of wonderful magnificence and beauty; "On," the great "City of the Sun;" with its three hundred temples, covered with gorgeous paintings; adorned with sculptured columns, carved with consummate art; its miles of splendid palaces, fronting the river's brink; its collossal

gateways flanked by Propylæ, through which the Nile pours into great canals, past terraces of temples, and closely shaded with palms and olives, from whose branches purple grapes hang clustering to the walks below; while as the trumpets with their silver peal announce the setting of the day god, his level rays flash back their parting splendor from his own emblem, upon the apex of a pyramid, two hundred feet in height; the golden shield of the great god, Osiris.

Near the person of the Queen, stands a man in the prime of life, wearing the distinguishing badges of the highest rank, and remarkable above the rest of her brilliant train, by his air of high command, his singular beauty and splendor of apparel. His features are Syrian rather than Egyptian, the expression of his face serious and thoughtful, and his whole presence noble and commanding.

Such was "Mosheh" or Moses, so called because "drawn from the water" by the childless princess, who had adopted him. Educated at Heliopolis, he had grown up there as a priest, under his Egyptian name of "Osarsiph" or "Tisithen." He was "mighty in words and deeds, and learned in all the wisdom of the Egyptians." Unaffected by the luxurious surroundings of the splendid court at which he had lived for forty years, its favorite and acknowledged prince; he was temperate and wise in all his habits, thoroughly trained in the art and

practice of war, as well as skilled in the sciences of which Egypt was then the fountain and the school. Learned in arithmetic, geometry, astronomy, medicine and music; versed in all the religious and philosophic systems of the age; the reputed inventor of engines for building, of weapons of war and instruments of hydraulics; he already ranked among the foremost of those whose wisdom and accomplishments made Egypt so renowned among the nations of the earth.

From the terrace where he stood, yet another scene was open to his view which, while it lacked all elements of beauty or magnificence, was full of grave and sad suggestions. Beyond the verdant belt of waving grain that fringed the river, stretched a desolate plain, crowded with thousands of moving figures toiling painfully at their yet unfinished tasks. Under the lash of cruel masters, wrought these makers of the sun-dried bricks, with which they builded temples, pyramids and cities. Coarsely clad, squalid and miserable, they passed their wretched lives in painful and degrading Among them were venerable men, and slender youths; mothers and maidens and young children, their shoulders bent with burdens, or bowed to their coarse labor, crimson with cruel stripes, and these sad thousands were but the types of millions like themselves groaning beneath this bitter yoke of bondage. Of the four

hundred years their race had been in Egypt, for a full century they had borne this heavy yoke of servitude, and no ear had heard their lamentation, and no arm was lifted to relieve them.—Sunken and degraded; callous to all their old traditions; despairing in the present, and hopeless of the future; they yet stood unwittingly upon the threshold of most august events.

How vast the contrast between these miserable bondsmen, and the young Prince of Egypt! How wide the gulf that yawned between their debased condition, and his brilliant state; and yet in the divine purposes fast touching their fulfilment, their lots were soon to blend in a stupendous series of events fraught with enduring consequences to the whole human race. The hand of Providence had guided them as a people through a bitter tutelage of sorrow, to a proximate fitness for their appointed future. When Joseph died, their three score and fifteen ancestors who had come into Egypt during his rule, were left with their descendants, in an anomalous position. Rapidly increasing in population, they were allowed to retain possession of a portion of the frontier country, perhaps upon the condition of its defence against the predatory tribes. The rude and warlike characteristics of the oriental shepherd, were probably modified in their case by the influences exerted by their enforced contact with a cultivated race; but is easy to understand

that between such neighbors and the Egyptians there were frequent causes of collision, and that as with marvellous rapidity their numbers swelled to millions, their presence and characteristics made it necessary for the government to interfere with their nomadic life, and force these free dwellers in tents to settle down as cultivators of the soil, in communities that could be watched and guarded, and that from this incipient control ensued those special forms of labor which sharply resisted, led to forcible supervision, and culminated in fixed and oppressive servitude.

Thus were the habits of their wild desert life broken, and established in fixed communities, their new circumstances trained them to agricultural labor and the arts of settled life; gave them the knowledge of manufactures, and the capacity for active business and useful employment, so tending to fit them for that great independent nationality into which it was designed they should ultimately expand.

Such was the position of the Hebrew people at the point of time, when, led by the same guiding hand, Moses touched the crisis of his life. He had reached an age at which it became necessary for him to determine the problem of his future. We cannot doubt that through his mother and his sister, as well as from the elders of his people, he had learned the secret of his birth, the incidents of his miraculous preservation, and the history of his race, with whose sufferings the sacred record discloses his sympathy, and he was probably required at this time to separate himself wholly from them, by some formal and conclusive act, or forfeit his high position and prospects as a putative Egyptian Prince and apparent heir to the throne.

Seldom has manly virtue been subjected to severer test, and more infrequent still are the instances in which the enervating influences of a court have developed such lofty self-abnegation and heroic patriotism as he displayed. Charmed doubtless with the brilliant surroundings amidst which his youth has passed, he had naturally enough put away from him the grave question, whose decision maturer years and pressing events demanded; but it is certain that he felt strongly for his kindred, and was stirred with longings for their deliverance. To indulge such feelings, was to sacrifice his high position, his brilliant prospects, his studious pursuits, his soldier's fame, the leadership of armies, the favor of the mighty Queen and the probable succession to a kingdom; yet turning from all these glittering inducements, the highest prizes that the world could offer, with disinterested and noble patriotism, he obeyed the higher instinct of his nature, and took the decisive step. He "refused to be called the son of Pharaoh's Daughter." In this simple statement of his decision, lies the

essence of volumes of eulogy. His natural sympathies soon took shape in acts. As "he went out among his brethren to look upon their burdens," it chanced that some cruel task-master was smiting a Hebrew, and fierce with indignation, he flung himself into the fray, and struck the Egyptian dead. Under the Court's displeasure at the time, because of the decision he had made, and known to be a Hebrew; this killing which had been witnessed by others, made flight inevitable, and crossing the Red sea and the deserts of Arabia Petrea, he sought refuge in the land of Midian.

Thus was another step taken toward the great result, and from the oppressors, stood forth the deliverer!

He signalized his arrival in Midian by his prompt rescue of the daughters of the Scheick Ruel, from the insulting Arabs; and his gallantry at once won him the favor of that prince, and the hand of his daughter. He became the shepherd of Jethro, and continued for forty years to occupy that position of humble service.

How sudden and startling this transition from the splendors of the court to the solitude of the desert; from high command to comparative servitude; from the luxury of a Palace to the black tent of the wandering Arab! Not purposeless was the change. His bosom had swelled with the great thought of effecting the deliverance of his people, and under the prompting of an earnest but immature impulse he had struck the first blow; but instead of its being followed by a general rising, his act only brought upon him reproach and ingratitude, and compelled his hurried flight. He had not sufficiently known either his countrymen or himself. Spiritless and debased; debauched by the flesh pots and insanely following after the filthy gods of Egypt, they were not fitted for the deliverance, and guided by his own hasty and uninspired passion, he was not prepared for the great functions of their Saviour.

The task of moulding and governing such a people, called for a thorough training on his part; a complete divorcement from the habits of his Egyptian life, and a spirit of patient submissiveness in positive contrast to the ardent and impulsive temper, he had brought with him into the seclusion and desolation of the desert. These requisites of character, he might well be expected to attain amidst the new influences of that wild land, in which nature had combined the grandeur of lofty and rugged mountains with the solemn stillness of the wilderness; and where from rocky hillside, sequestered valley and green oasis, where rose the gracious springs, to which he led his flocks; he could look up to that "Mountain of God," whose brow tradition had clothed with the awful shadow of the Divine Presence.

There, shut out from excitement, and in contact only with the peaceful incidents of pastoral life; he revolved in studious contemplation all that he had gathered in the life and study of Egypt; all he had learned from the elders, and traditions of his people, of the predicted termination of their period of bondage, the promised inheritance of Canaan, and the great problem of their deliverance; and there it may be, began to take shape in his divinely illuminated mind, that oldest of all written books, that ages before Heroditus and Homer, excelled the one, in the simple grandeur of its historic narrative, and surpassed the other in the lofty vigor of its poetic imagery, and which clothes its majestic revelations in the sublimest language man has ever penned.

But whatever works or contemplations may have filled these years of sojourn, whatever the preparatory teachings of his Egyptian life, it is in the solitary wilderness the divine legation comes.

The wild Acacia, spreading its tangled branches, over the rugged ground, bursts suddenly into unconsuming flame; and as he bends before it with unsandalled feet and hushed and reverent heart, "the Lord appeared to Moses," and from its fiery midst rang out the re-announcement of the old, unchanging covenant: "I am the God of Abraham, the God of Isaac, the God of Jacob. Behold the cry of the children of Israel is come up before

me, and I have seen the affliction with which the Egyptians afflict them. Now, therefore, I will send thee unto Pharaoh, that thou mayest deliver my people, the children of Israel, out of Egypt!"

The glory of the visible Presence, fades from the face of the desert, and the selected leader inaugurates the great deliverance.

The reluctance of Moses to undertake the work, was naturally great. His reflections upon the failure that signalized his first attempt, his conviction that his countrymen would neither recognize his authority nor accept his leadership, the memory of the ingratitude and insults he had received at their hands, the influence upon his temper and habits of thought, of his secluded life in Midian, which disinclined him with the weight of eighty years upon him, to undertake its grave responsibilities; his freedom from personal ambition, and a modest consciousness of unworthiness, led him to plead with persistent and unwarrantable boldness, his "uncircumcised tongue," and to seek a sign to confirm his hesitating faith. In infinite condescension this was accorded, and bearing in his "white and shining hand," miraculously restored from its leprous state, that wonder-working staff, mightier than warriors' sword or kingly sceptre, and on his lips the sublime Name he was commissioned to utter; he went forth upon his majestic mission.

Never before had embassage so august, claimed audience of the Pharaohs! Thrones and dominions, principalities and powers, mightier far than royalties of earth, stirred with profoundest interest, gathered to watch the mighty contest, whose issues were to be the predicted exodus, the confusion of the false deities of Paganism, the rescue and establishment of the true Church, and the vindicated honor and worship of the one, only God.

The miracles by which these results were accomplished, may be analyzed and considered in various aspects, all full of interest and suggestion. Being divine, they were perfect, and following the fixed law of such manifestations, there was no waste of power, but each one of the ascending series achieved fully its intended purpose. The debased Hebrews had largely lost their purer faith, and were in bondage to Idols. Pharaoh, who crushed them to the earth with burdens, represented to them a present and fearful power, visibly and tangibly dominating every instant over their miserable for-They had well nigh forgotten the Deliverer whose coming tarried so long. It was needful they should recall him as one greater than Pharaoh, and almighty to save. Their complete rescue from Idolatry was plainly to be best accomplished by the contemptuous overthrow of the false system, and its objects of worship.

The bold spirit of Pharaoh, whose resolute exercise of his prerogative of free will in opposition to the divine commands, opened the pathway of the miracles; required to be signally overcome before the eyes of the people so long enthralled by his despotic power. With curt simplicity and graphic force, the historian states the opening of the conflict. Moses went in unto Pharaoh, and said: "Thus saith the Lord God of Israel. Let my people go!" And Pharaoh said: "who is the Lord, that I should obey his voice to let Israel go? I know not the Lord, neither will I let Israel go!"

What a picture is here presented to the imagination!

The haughty King, almost sublime in his self-sufficing consciousness of power, seated on his magnificent throne, clothed in purple and gold, wearing the crown of the proudest sovereignty of the oriental world; environed by his splendid retinue of princes, courtiers and magicians, the vast Hall of Audience, adorned by columns sculptured with choicest art, its long avenues of statues of the Gods, its gorgeous coloring and splendid hangings, and crowded with attendant soldiery in dazzling uniforms, with gleaming and jewelled helmets; all that boundless wealth and unlimited power could minister to regal splendor; and in the midst the isolated group of venerable men, in

simple garb, with white and flowing beards, gathered around the two majestic brothers; who strong in the faith of their great mission, dared thus sublimely to confront the majesty of Egypt!

I do not propose to analyze in detail the miracles wrought by the hands of Moses and Aaron. Some general observations must suffice for the purposes of my necessarily rapid sketch. In any estimate of their peculiar force, regard must be had to the customs and character of the country. It is the sacred Nile, whose worshipped waters flow in blood. The animal life smitten is consecrated. The land stricken, is "a garden of the Lord," stretching in green and luxuriant fertility from the Cataracts to The magicians vanquished, are the the Delta. wisest and most accomplished representatives of that occult and mysterious power; that blended the permitted influence of evil spirits with all that was startling and ingenious in a perfected system of oriental jugglery. The Idolatry overthrown, was the most systematised and dominant of the antique world; rooted in the prejudices, elevated by the learning, consecrated in the customs, and interwoven with the whole life of the people and the state. Egypt, polished and cultivated, was the teacher of the surrounding nations in all the evils of Pantheism.

It is not necessary to trace the fitness of each miracle, to some special phase of the prevalent

Idolatry, nor attempt to distinguish the degrees in which the supernatural and the natural were blended in them, for whether regarded as calamities foreign to Egypt, or natural, but exhibited in intensified forms; they were still the work of supernatural power, and equally fitted to accomplish their intended results, and fully attest the legation of Moses. The order of their progress is striking, and the scale of their dignity constantly ascending. Aaron, in explanation of whose works it could not be urged that he was "learned in all the wisdom of the Egyptians," is first in the order of agency; to him succeeds his greater brother, and the conclusive blow is struck directly by the hand of "the Angel of the Lord."

The nature worship of Egypt, as explained by Fairbairn, recognized both the good and the evil principle, and each was deified under many forms. Typhon, the evil principle, worshipped because of his supposed power over the hurtful influences of nature, was encountered and overthrown in those plagues in which the natural evils, to which the land was subject, were intensely aggravated; as of the lice, the flies, the locusts and the boils. The worship of the good principle, in nature deified her genial and productive powers; the beneficent Nile, the crystal atmosphere, the resplendent heavens, the brilliant sun. The sacred river, turbid with blood, or teeming with innumerable frogs, became

loathsome and pestilential. The clear atmosphere blackened into darkness that might be felt. The glorious sun was shrouded and hidden in impenetrable gloom; and so the whole system in both its aspects, was completely overthrown, and the Gods of Egypt confounded and put to shame.

The tenth and last miracle, rounds the fearful series with signal illustration of the divine power and glory. Around it gather sublimity and awe. Commemorative and typical associations forever isolate it from its predecessors, and fix upon it the reverential regard of Christian and Hebrew alike.— Ever memorable must be that fourteenth night of the month Nisan, in the eighteenth century before the Christian era, when the solemn stillness of the midnight was broken by the tramp and stir of the exodus; for among the grandest spectacles ever presented in the world's history, that of which Egypt was then the theatre, stands in the unique significance of its sublime and awful con-Grandly opposing, the forces of destruction and salvation, of agony and rapture, of life and death; confronting each other, dominated over the separated millions of the doomed and the delivered people. One-half the picture is shrouded in the blackness of midnight, as in all the habitations of Egypt; in the wild abandonment of their mighty grief, the stricken households, with frantic cries and passionate lamentations bewail their myriad

The other, is radiant with the glory of consummated expectation and jubilant with the consciousness of assured deliverance. From weary limbs and long bowed heads, shackle and yoke are falling; as with exultant spring, a nation leaps from slavery to freedom. Hastily assembled from all parts of the land, the Hebrew families within the sacred immunity of their blood-stained door-posts: with shod feet and girded robes, and staffs in hand; tear eagerly the Paschal lamb and eat the unleavened bread, and as the glad sun of liberty flings his new splendors over the field of miracles; past temples and palaces and gateways, thronged with crowding thousands of awe struck gazers; the swaying multitudes, with shout and song, with tramp and roar; press onward, bearing away in their triumphant arms, the riven gates of their House of Bondage!

The refluent waters of the Red sea, sweep over the pursuing hosts of Pharaoh, and with the victorious song of Miriam upon their lips, the ransomed people follow into the wilderness of the wanderings, their divinely appointed leader and law-giver.

We have now reached another of the forcible contrasts that mark the life of Moses. The prince, soldier and student of Egypt, the humble servitor tending the flocks of the Arab Scheick, and the august agent of the deliverance; is now to be regarded as

the leader and head of a turbulent, debased, exacting and unmanageable multitude, which is to be trained, disciplined and moulded under his guidance into the form and comeliness of a great nation. Clearly the task is superhuman, and yet through many and weighty volumes, the untiring spirit of infidel criticism, has labored ingeniously to disconnect from its successful accomplishment, the plain fact of the inspiration of Moses. Neither a fair regard to your intelligence, nor the more general view my limits oblige me to take of the legislation of Moses; permit me to enter into any detailed statement or refutation of the allegations underlying these criticisms.

The evidences of the inspiration and providential training of this great character, are clear as the demonstration of a mathematical problem, and he stands confessedly at the head of the legislators of the race. It is not possible for any candid mind to consider the long line of incidents so signally marking his life, and all converging to the point of the work he was called upon to accomplish; from the current that floated his little ark to the feet of Pharaoh's daughter, the selection by her of his own mother as his nurse and first teacher, his training as a soldier, his education as a priest, his high position at the Court of Egypt with its advantages of observation and experience, his yearning heart beating in sympathy with his oppressed coun-

trymen, his noble decision in their favor against the splendid allurements of his position, his sojourn in Midian with its mental training and development, his reappearance at the Egyptian Court at the most opportune moment for action, wielding supernatural powers in attestation of his mission; and his whole career, from the Red sea to the solitary mountain, in whose dark and awe-girt defiles, archangels contended for his body; it is not possible fairly to consider all these marvellously adjusted and connected links, and not accept the chain of evidence as complete and irrefragable. In fine, to deny his inspiration, is to deny the Bible, and so the question conclusively settles itself.

Moses was not only inspired, but the divine gift descended upon him under manifestations of marked sublimity and significance. His was the inexpressible dignity of direct and personal communion with the source of all inspiration, and before the burning bush, upon the cloud-girt and trembling mountain; and in the dread seclusion of the innermost tabernacle, he grew radiant with the reflected glory of the supernal Presence as he sought the wisdom that suggested and gained the sanction, that enforced the wonderful code of laws that bears his name.

So educated, trained and appointed to his work, endowed with a superior intellect, with high qualities of statesmanship, versed in all the wisdom of

the age in which he lived, with great sagacity and judgment, energetic in action; free from personal ambition and lifted by a noble ardor above the littleness of selfishness, patient, fearless, disinterested, much enduring, and patriotic in the highest and purest sense; Moses is not to be treated as a mere passive instrument of the divine will, playing an unconscious part in the great actions with which he is connected. Neither the concurring testimony of the Church, nor the repeated references to him in the New Testament, remarks Stanley; as, "Moses gave you circumcision"-"Moses because of the hardness of your hearts suffered you"-"Did not Moses give you the law"--" Moses accuseth you"--" They were all baptized unto Moses;" justify this limited view. The frequent addresses of the Divinity to him, no more contravene his personal activity and intelligence, than in the case of Elijah, Isaiah or St. Paul; and we can easily understand, says Fairbairn, how his Egyptian training, without the slightest derogation of his divine mission, was turned to valuable account in the work given him to do; nor have we any reason to suppose that the divine direction and counsel imparted to him, superseded the light he had obtained, or the benefit he had derived from his opportunities of becoming familiarized with the internal affairs and government of Egypt.

In consonance with what we know of the method of the Divine procedure, in harmony with the countless analogies of nature, in obedience to the general law that operates through human agency, and regarding always the fitness of the instrumentality, perfects the aptitude for the proposed result; it was not in a condition of mere passivity, but as a highly conscious, intelligent and trained instrument, that Moses entered upon the great task of framing for the Hebrew people, a code of laws suited to their circumstances, and competent to train them for the national existence upon which they were about to enter. Evidencing in the highest degree the wisdom and skill of the legislator, the polity he framed, instead of being a system of abstract legislation, adapted itself with considerate care, to what the Hebrews had been, were, and were destined to become.

Excelling his fellow countrymen in the learning of the land they had left, Moses recognized in his legislation the influences exerted upon them by the civilization and arts of life with which they had grown familiar, and that the development of their civil and religious life, required a relative progress in the system he established. Antedating the Grecian civilization, as it did by ten centuries, but two systems, the Egyptian and the Asiatic preceded the Hebrew. Many inherent causes developed both of these into aggregations of power, in the hands of

castes and privileged classes, and these in both cases built up and conserved that power upon the basis of the ignorance and superstition of the people, and a hideous and systematized Idolatry was thus enthroned and perpetuated. Thoroughly versed in the speculative ideas of both of these systems, and realizing the tyranny and debasement in which they culminated, Moses struck down the whole fabric of imposture and superstition, by recognizing the good of the people as the cardinal law of political philosophy, and the sovereignty of God as the essential idea of true religion, and he established a form of government, and a code of laws, that mature and perfect when given, have come down to us in their complete integrity through intervening centuries, cumbered with the wrecks of countless systems, and heaped with the ruins of mightiest empires.

How much of that system binds us in this remote generation, I leave others to discuss; certain it is, that the obligation of parts of it, is as stringent as when enunciated amid the thunders of Sinai, and will never lose its force as long as earth and man shall exist; and so long will be found in it the clearest evidence and illustration of the self-existence, providence and perfections of God; the purest standards of virtue, benevolence and truth; new and forcible views of broad and philosophic principles of law; the germinal ideas of great results

in the succeeding legislation of the world, and wise and equitable rules of government applied with consummate judgment and skill. Its principles of political, civil and criminal law, are more or less interwoven in the systems of all subsequent times; and marvellous because of its inherent merit, and hallowed by the associations of its inception and delivery, the polity of Moses will never lose the sacred interest that attaches to it, as it goes down the centuries co-existent with the immortality of the Bible.

As a philosopher, ages before our advanced science, Moses anticipates some of its latest discoveries. Beside the puerile and monstrous conceits of pagan mythology and legend, he builds up the fabric of an orderly creation, worthy the benediction of its Maker. He represents the earth as having been without form and void, and modern geology testifies to the antecedent confusion, desolation and death, his statement involves.

He tells us that light was formed, before the sun came as a bridegroom out of the chambers of the morning, and our latest science holds it to the effect of the undulations of a subtle ether pervading space, and finding but an exciting cause in that great luminary.

Centuries before the glass of the astronomer explored the heavens, or the hammer of the geologist let out the mysteries of the rocks, he states facts in regard to the order and phenomena of creation, to the verity of which the nineteenth century sets its corroborative seal.

Moses is the earliest and among the greatest of the prophetic bards of Israel. No matter to what august heights his subject bears him, the sweep of his strong wings is level and untiring.

Calm and laconic, he puts into a single sentence the work of countless ages. A chapter gives the arrangement of the present form of creation, and pictures the primeval paradise.

A few simple and effective touches, and the grand outlines of the Deluge are delineated.

With striking force and vivid coloring, he sketches Abraham; and the social life, government and religion of the patriarchal times are depicted.

In a few pregnant words he describes the creation of light, and by universal consent, the brief sentence is accepted as a perfect model of the sublime and beautiful.

In simple and touching narrative he tells the story of Joseph, and the common heart of humanity thrills to the touch of its inimitable pathos.

He is inspired with a sublime lyric afflatus, and in its outburst of exultation we seem to hear the roar of the surging billows; the articulate agony of the hosts of Egypt, and the ringing timbrels of the millions of Israel; as above the voices of the tempest, rolls the triumphal pæan of deliverance.

He meditates the frailty and briefness of human life, and his plaintive elegy is unmatched in its sad and touching beauty.

He looks out upon the myriad tents of his people as they spread like snow-flakes under the shadows of Pisgah, and with a burst of enthusiasm he pours forth a song of farewell, worthy its opening invocation of the audience of earth and heaven.

An hundred and twenty years have set their crowns upon his head as he stands upon the summit of Nebo, and surveys the land of promise, he may not enter. Beneath him, far spreading over the plains of Moab, lie the tents of his people, before which the sorrowing tribes have gathered to look for the last time upon the form of their beloved leader and law-giver. "Eastward and westward, northward and southward," he lifts his undimmed eyes, and looks out upon the mountain ranges of Palestine. All Gilead he sees, with Hermon and Lebanon, the Galilean Hills, and the shimmer of the far lake of Gennesareth. He marks the broad expanse of the battle plain of Esdraelon; Jericho with its encircling palms, and the summits of Gerizim and Ebal; and as his vision sweeps over the fair expanse of fencéd cities, and fertile fields and swaying forests; and his triumphant feet press the mountain peak, dedicated to the Idolatry he had labored to overthrow; we may well believe that in that supreme moment of his majestic life, there rose also before his inspired vision, parts of that grand procession of events, destined to link the future of his race with the august purposes of their covenant God. The triumphs of the hosts of Israel, when with great slaughter, the Canaanitish kings were smitten at the waters of Merom, and the haughty Amorite went down before Joshua, what time "the sun stood still upon Gibeon, and the moon in the valley of Ajalon"—the illustrious Judges, who with varied wisdom and success, governed the settled nation—and the long line of sceptred kings, the splendors of whose regal sway, culminated in the full orbed magnificence of Solomon; while as his last lingering gaze is fixed upon the narrow ridge, through whose torn rocks gleam the white housetops of Bethlehem; and the Judean Hills, where rise the fortressed walls of Jerusalem; although as yet, no star of guidance hangs over the one, and no voice of earthquake announces the omnipotent expiation that sanctifies the other; the prophetic vision sweeps to its majestic close, with the revelation of the manger and the cross, of his greater successor and archetype, and the consummation of all prophecy, in the final and supreme dominion of the Divine Prince of the House of David.

Grand in the action of his life, Moses was sublime in the incidents of his death.

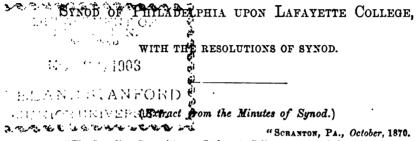
The voices of them that wept, and the wail of a nation's lamentation, smote with mighty monotone against the rocky heights of Abarim; as the descending cloud wrapped him in its mysterious pall, and the Angels of God, buried him, "over against Beth-Peor!"



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ADDRESS OF PRESIDENT CATTELL

BEFORE THE



"The Standing Committee on Lafayette College presented the following resolutions, which were unanimously adopted:

"Iterolved, That Synod gratefully recognizes the hand of Divine Providence in the present prosperity of Lafayette College, and records anew its thanks to the generous men whose donations have enabled it so to enlarge its curriculum as to meet the increased demands of the age.

"Resolved, That Synod rejoices in the establishment of a Polytechnic School in connection with the College, and we recommend those who intend their sons to be Engineers, Miners, and Chemists, to avail themselves of the advantages offered by a college so distinctively Christian and Presbyterian, so admirably situated for such studies, in the very midst of the great mining and manufacturing region of our country, and so well provided, through the munificent endowment of Mr. Pardee, with the means and appliances of technical instruction.

"Resolved, That Synod commends this College anew to the liberality of our people, especially those whom God has blessed with wealth—that it may be speedily relieved from any present embarrassment arising from the varied and extensive work it has already undertaken, and may be able to enter with efficiency upon the still wider field opening before it, and that President Cattell be requested to print, for the information of our people, the statements and appeal made by him to Synod."

The address which accompanied the Report of the Trustees of Lafayette College to the Synod of Philadelphia, is herewith submitted to the public, in compliance with the above request of Synod, and in the hope that its statements may call attention to the enlarged work undertaken by the College, and to the great need of an addition to its resources that this work may be carried on with increased vigor and efficiency.

In presenting the Annual Report of Lafayette College, for the first time, to the Re-united Synod of Philadelphia, to which it now properly belongs, I shall make a somewhat fuller statement than usual of its condition and prospects. To this I am prompted by the

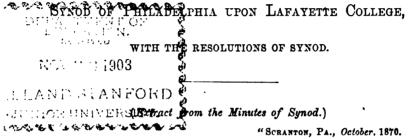
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And perhaps I should first of all gratefully refer to that favoring Providence which has marked the recent history of the College. Why God so long delayed to answer the prayers of its pious founders and early supporters, is not for us to know. Although its history, during long years of patient and unwavering devotion, abundantly proves their large self-sacrifice, and their devout consecration to the work, almost the entire generation that saw its corner-stone laid in faith and hope, passed away without seeing its successful establish-More than once, indeed, it seemed on the very brink of dissolution. Many of you know that in one of these critical periods in its history, (1886,) only ten years after its charter was signed, it was saved by the voice of Dr. Archibald Alexander, of Princeton. He had the sagacity to see the importance, for the development of our Church in eastern Pennsylvania, of permanently holding the central position at Easton, in the interests of Christian learning and culture; and regarding its future relations to Princeton College, of which he was a Trustee, as one of generous and beneficent emulation rather than of injurious competition, he earnestly protested against surrendering the ground which had been occupied, already at so much expense, under the auspices, if not in the name of the Presbyterian Church. It is also known to some of you that even so late as 1863, the financial condition of the College was so alarming, and its friends generally so -disheartened, that a special meeting of the Trustees was called to "take into consideration the propriety of suspending operations under increasing embarrassments." At the meeting of the Synod that year, the impression seemed general that Lafayette must go the way of Dickinson, and the Presbyterian Church of eastern Pennsylvania double its shame in thus permitting two colleges, within a few years, to go to pieces on its hands. The chairman of the Synod's Committee, to whom this whole subject was referred, has told me that never in his life had he felt more profoundly the importance and solemnity of a trust. He went to his room, and kneeling before God, earnestly implored the Divine guidance. Should he formally propose to Synod the abandonment of these consecrated halls? Let me read

to you the resolution which he reported, and which was unanimously adopted by the Synod:

"Resolved, That Synod re-affirms its undiminished interest in Lafayette College, and will not cease to labor and pray for its final and successful establishment, under the divine blessing, beyond all contingencies."

Scarcely had these vows been recorded, when the College was visited with a most blessed revival. It seemed altogether removed from human agency, and so plainly from the hand of God, that it appeared like His seal set anew upon the College. The Spirit of the Lord seemed to descend suddenly, and to "fill all the place." The number of students was small, but it was observed in most of the prayer-meetings that rarely was a student absent. There are those, and I see one before me now, who are this day preaching that pardon and peace to others which they then sought and found for themselves. Then came the free-will offerings of the people, still showing conspicuously the hand of God, in that he turned to this College, for the first time in its history, the hearts of the wealthy and liberal. Mr. Pardce's first gift to us of twenty thousand dollars was, at the time it was made, the largest sum ever given by one man to any educational institution in Pennsylvania. Our donors always have been few in number, but they now began to reach out to us their full hands. We had read of such great things done for Harvard and Yale, and it seemed more like a delicious dream than a reality when these large benefactions were made to us by single individuals. One paid the existing debt; another bought additional grounds; another built an Astronomical Observatory; another, a Chemical Hall; another endowed the Chair of Chemistry; another, the Chair of Botany; four others built Dormitories for the students; the citizens of Easton added a spacious and handsome Wing to the main College Building; and the endowment fund rose to over two hundred and fifty thousand dollars. The whole number of the students in actual attendance during the year of the revival was forty-one; this fall the new students alone numbered over ninety. The Faculty then consisted of nine members, now its enlarged field demands the full services of twenty-two.

Thus, brethren, has God answered the prayers that went up from the thousands in Israel for the successful establishment of Lafayette College;—exceeding perhaps the fondest hopes of her own sons, who, with rare devotion, have loved and cherished her through all the trying vicissitudes of her history.

THE ORGANIZATION AND WORK OF THE COLLEGE.

The question has often been asked, "What need have you for so many Professors?" The answer may perhaps be most satisfactorily given by a somewhat detailed account of the varied and extended work we have undertaken. To this I invite your special attention.

The works of the College may be described under five different Departments, viz., the Classical Course, Scientific Course, Technical Course, Working Sections, and Special Courses of Study.

I.

First and foremost among these in its relations to a general, thorough education and culture, is the old and well-established College Course, the basis of which is the Latin and Greek languages. An unfortunate impression has prevailed in some quarters that Lafayette College has abandoned the Classical Course, or at least made it secondary in importance to the scientific. I assure you that this is far from being the case. The very first paragraph that meets the eye of any one who chooses to examine our Catalogue is as follows:

"The Classical Course is similar to the Undergraduate course of our best Colleges; it will continue to afford the amplest opportunities for the study of the Ancient Languages. It is the earnest endeavor of the Board to give it greater efficiency year by year. They regard it not only as the regular introduction to the special professional study of Theology, Medicine, and Law, but also as a thoroughly tried means of securing the culture and elevation of mind, and of imparting the useful and liberal learning which becomes a Christian scholar."

Indeed, we have repeated such statements so often and so publicly that there ought to be no longer any room for misapprehension upon this point. I hope the members of Synod noticed in the report of your Committee of Examination, read this morning, that while these brethren say, "as to ALL the examinations they witnessed your Committee would express their unqualified approbation," they laid special emphasis upon the thoroughness and efficiency of the Classical Course. Let me quote their words:

"Your Committee were particularly gratified with the method in which the ancient Classics are there taught, not only in regard to the thorough drill in the grammatical structure of the languages and their literature, but specially in regard to the philological feature of the instruction, which, though somewhat novel, impressed the Committee as very valuable."

Now it would have been perfectly proper for me to call the attention of the Committee to this feature, and if it impressed them favorably, to request special mention of it in their report; but no such attention was called and no such request was made. I knew nothing of their report until it was read in your hearing, and I must express my gratification to find that so far from the Committee discerning even a trace of that neglect of the classics which some supposed would follow the introduction of the Scientific Department, they were "particularly gratified" with the thorough instruction at Lafayette, not only in the Grammar but in the Literature of the Classics. We insist upon it, that our Course in Greek and Latin is of a high order; that it is not only exact and thorough, but is more extensive than in most Colleges. Even if its relations to manly culture were not so deeply felt by us, and its importance also to those who intend to study Law and Medicine, we should maintain this Classical Course in its integrity for the many candidates for the ministry who pursue their studies at Lafayette. For them a thorough training in Latin and Greek is acknowledged by all to be indispensable. And in this connection I may remark, that we have had for some years an optional course in Hebrew, which has been of great advantage to our candidates for the ministry. How far we have succeeded in giving efficiency also to this, may be seen from the fact I learned yesterday, that the first and second prizes given to entrance students at Princeton Theological Seminary, after a full examination of all the candidates, were awarded a few weeks since to graduates of Lafayette College!

II.

But while thus retaining the regular Classical Course and aiming to give it even "greater efficiency year by year," the Trustees have added a parallel Course in which the philological study of Modern Languages takes the place of Latin and Greek. It is designed for those who wish to study the Natural Sciences, Mathematics, Modern

Languages and Literature, History, Logic, and Mental and Moral Philosophy, as thoroughly as they are studied in our best colleges, and who would be glad to enjoy the cultivation and learned habits and associations of college life, but who, whether wisely, or unwisely, will not study the Ancient Languages. It is called the Scientific Course, to distinguish it from the Classical, though it contains liberal provision for philological study, substituting Modern Languages and Literature for the Ancient.

President Barnard of Columbia College has recently published some carefully prepared tables of statistics by which it appears that notwithstanding the largely increased number of colleges in our country, the number of college students in proportion to the population has been steadily decreasing for the last thirty years. Why is this? Not because the young men of this generation have less means, or are less impressed with the value of education; but because they do not, to so great an extent as formerly, feel the importance of the education heretofore afforded by our Colleges on the basis of the ancient languages. I do not propose to discuss the point whether they are right or wrong, but the fact itself is so apparent that our oldest and best established Colleges have made large concessions to this class by shridging the Latin and Greek; providing elective studies in the upper classes; in some cases making the study of the Classics optional after the first half of the Sophomore year. It seemed to us that this was neither one thing or the other; it could not pretend to give the finished culture that is claimed for thorough classical studies, while for the smattering of Latin and Greek it required for admission, it kept many students from the advantages of the rest of the College Course. It deprived them altogether of an education, or forced them to enter a lower grade of institutions known as Business or Commercial Colleges. We therefore determined to retain the old Classical Course in all its integrity, for those who desire it, and to add another course, pure and simple, with no Latin and Greek at all, but with an adequate amount of philological study, having for its basis Modern Languages, especially the English.

I beg you to understand, Brethren, that in thus yielding to what we regarded as a reasonable demand of the "New Education," we are not disposed to make any rash or hazardous ventures in our

methods of study, either in the old or new Course. We do not seek to attract attention by any novelties or educational experiments. On the contrary, we have aimed to lay the new course as near as possible to the old and well-worn track. Our Catalogue says:

"The Trustees of the College are deeply impressed with the thought that our present collegiate system has grown up under the fostering care of the Church, and that the relations of our old college studies to manly culture and religious training have been studied by generations of Christian educators. They have therefore taken care that the new course shall not be removed from the old landmarks, and that as far as possible the old approved methods of instruction shall be used in all the departments of study. It will be found that the new course includes all the studies of the old, except the Ancient Languages, and it is believed that the method of teaching English and other Modern Classics, which has been for some years in use in the College, may be so adapted to the students of the new course as to give in a good degree the same kind of discipline that is derived from the study of Greek and Latin."

Though this new course demands a large addition to our Faculty, and has therefore largely increased the expenditures of the College, we believe it was due to the community that it should be established, and we intend to carry it on, as well as the Classical Course, with earnestness and vigor. A distinguished Classical Professor in one of our best colleges told me that he favored such a course in the interests of classical education! It would squarely meet the new demand and leave the old classical culture a freere opportunity for development.

TTT.

But the greatest and most expensive addition to our Curriculum, and one which only the munificence of Mr. Pardee enabled us to add, is the Course in Technical Studies. Let me quote again from our Catalogue:

"In addition to the GENERAL SCIENTIFIC COURSE, which is designed to lay a substantial basis of knowledge and scholarly culture, courses of four years each have been arranged, in which students may, if they choose, devote themselves during the Junior and Sonior years to studies essentially practical and technical, viz,

I. ENGINEERING, Civil, Topographical, and Mechanical. This Course is designed to give professional preparation for the location, construction, and superintendence of kailways, Canals, and other Public Works; Chemical Works and Pneumatic Works; the design and construction of Bridges; the trigonometrical and topographical survey of States, Counties, etc., the survey of Rivers, Lakes, Harbors, etc., and the direction of their improvement; the design, construction, and use of Steam Engines and other Motors, and of Machines in general; and the construction of geometrical, topographical, and machine drawings.

II. MINING AND METALLUREY. This Course offers the means of special preparation for exploring undeveloped mineral resources, and for taking charge of mining or metallurgical works. It includes instruction in Engineering as connected with the survey, exploitation, and construction of mines; with the construction and adjustment of furnaces and machines; and with machine drawing; also instruction in Chemistry and Assaying, as applied to the manipulation of minerals.

III. CHEMISTRY. This Course includes text-book study, lectures and laboratory practice, every facility for which is found in the Laboratories of Jenks Chemical Hall. Particular attention is given to the Chemistry of Agriculture, Medicine, Metallurgy, and the Manufacturing processes."

In short, the aim of these Technical schools is to give a professional education to Engineers, Miners, and Chemists equal to that afforded by such celebrated schools as the Rensselaer Polytechnic at Troy, the Columbia School of Mines at New York, and the Massachusetts Institute of Technology at Boston. Each of these Institutions is represented in our Faculty by one of its graduates, as is also the school of Mines at Freiberg, Saxony, the oldest, and in some respects the best in the world. We seek thus to profit by the matured experience of them all, and we design that the buildings and appliances for the Pardee Scientific School at Lafayette College shall compare favorably with the best in the country.

Moreover, it is the aim of the Trustees that these Technical Courses shall have a decided and pronounced Christian character. How much shall it profit your son if Instructors in Science, while teaching him much that is valuable in his future profession, shall teach him to despise the faith that you hold dearer than your own life? And even where Trustees and Professors may be respectful to the claims of religion, or may exemplify its spirit in their own lives of consistent piety, is there not something lacking, if no Christian character belongs to the School as such? Our theory is, that the scientific school, like the college, ought to resemble a Christian family with its morning and evening prayer, its common altar for Sabbath worship, and its stated hours of biblical instruction. A community of scholars has an organized life, differing from a body of clerks in a bank, or of workmen in a shop; and there are parents, I am sure, who will be glad to know of a Polytechnic school equal to any in the land in its appliances for study and in the learning and ability of its instructors, which aims also to establish a character distinctively Christian and evangelical.

An important consideration which led to the establishment of these

Polytechnic Courses at Lafayette, is the peculiar relation the College bears, on account of its position, to the industrial resources of the country. As the Circular of the Pardee Scientific Department says:

"Lafayette College is in the midst of the great mining and manufacturing region of the middle States. Every process used in the mining and working of the various ores of inon, and in the manufacture of iron into the thousand forms in which it is used, is going on almost within sight. Near by are the COAL MINES which supply the markets of Philadelphia and New York. Mineral wealth abounds on all sides. The expert is continually called on to examine new tracts of land, to analyze new ores, and to devise new ways of working and handling them. Here, every resource of engineering is displayed in the works connected with the preparation and transport of LUMBER, and the carrying of RAILROADS and CANALS through the mountains and over the rivers. Those who wish to prepare themselves to be working engineers in any of these departments, come from all parts of the country to observe and study these works, and it is most desirable that adequate means should be provided for the prosecution of scientific studies in the midst of them."

Having, then, such advantages of position, and such a thorough organization, ought not these Technical Courses, if we worthily, fulfil our pledges, to receive the patronage of the Presbyterian community; at least of those within easy access of Easton? It will take some time for us to secure such patronage as the older polytechnic institutions enjoy, and if in the meanwhile this great expense is reduplicated in the establishment of new schools in the field which we are abundantly able to take care of, will there not be the same sad story which has been the reproach of our colleges, of several feeble institutions occupying, if not filling, the field which should belong to one really strong and vigorous?

IV.

The WORKING SECTIONS of the Pardee Scientific School may be regarded as a separate Department. The full regular course is designed for those who have time and means for thorough preparation. It is based on the fact that an Engineer, a Chemist, or a Miner, wants to be a thoroughly educated man, both in the general branches of learning, and in those strictly of his profession;—like the Minister, the Lawyer, or the Physician. But there are those who seek these professions who have not time or means for the full course. Such persons having suitable preparation may devote their whole attention

at Lafayette, for a short time, to thorough preparation for professional employment in the following branches, viz.,

1. ROAD ENGINEERING.

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- 2. MINING ENGINEERING.
- 3. MINING GEOLOGY, AND METALLURGY.
- 4. Applied Chemistry.

I need not enter into the details of all these branches, (they can be found in our Catalogue,) but as an illustration of the whole, take that of ROAD ENGINEERING. The class is organized, and fully equipped as an Engineering Corps, and goes through all the necessary operations for the construction of a railroad from Easton to some selected terminus, each step being accompanied by text-book study and lectures. In this way both theory and practice are thoroughly taught. There is first the preliminary study of maps, and the reconnoissance; then running the preliminary lines, with maps and memoirs of the same, and the final location of the road, including grades and curves. The final maps show longitudinal and cross sections, excavations, &c. This is followed by the study and location of tunnels, bridges, and depots. The entire Field Work and Office Work, including drafting and calculations, is performed under the direction and supervision of the Professor. Examinations are also made of the celebrated Engineering Works that abound in the vicinity of Easton, and written reports made upon them, accompanied by plans, calculations, and discussion of the principles involved. No one can fail to see what an advantage such a course offers to young men who aim to become Division Engineers, yet who are not able to take the entire course.

V.

To a fifth Department may be referred the provision at Lafayette for SPECIAL or ADVANCED students in certain Departments, such as Natural Science, History, Modern Languages and Philology, especially the philological study of the English. The studies are under the direction of the Professors of the several Departments, but are not confined to any fixed range.

The Observatory offers the usual facilities for an advanced course in Astronomy. The Laboratories are fitted up with experiment desks and other arrangements for those who may wish to make original researches, or to study any branch of applied Chemistry, under the Professor who has been connected with this Department more than thirty years. The College Herbarium contains the most complete Flora of Pennsylvania in existence, and offers unusual advantages to Post-graduate students of Botany, who may also avail themselves of the aid of the Professor by whom mainly it was collected during twenty-five years of enthusiastic labor. And I beg to remind you that Lafayette was the first college in this country to establish a distinct Professorship for the philological study of our own language. There is something in this very fact that inspires with a scholarly enthusiasm those who come to Lafayette to pursue this special branch of study, under the Professor who was the first appointed to this Chair.*

And now, Brethren, in these statements as to our work, you have the answer to the question why we have so many Professors. To carry on all these Departments vigorously and successfully requires a large as well as an able corps of instructors, and this brings me to the consideration of our expenditures.

EXPENDITURES AND RESOURCES.

Although each step in the enlargement of the courses of study seemed forced upon us by the public demand, and although the whole

^{*} In connection with the above statement, I may be permitted to quote the following from an Article in the last number of the North British Review, (October,) entitled, "The Higher Education of the United States."

[&]quot;A distinctive feature worth mentioning is seen in the curriculum of Lafayette College, at Easton, in Pennsylvania. This is not one of the largest institutions of the kind, but it is eminently distinguished by the intelligence and zeal which pervade its arrangements, and make themselves felt in the success of the teaching. For some years past, under the able direction of Professor March. the English language has been made a prominent feature in the programme. The Professor treats the English author chosen for study-Milton, for instance—as a competent classical teacher does Homer or Virgil. The text is minutely analyzed, the mythological, historical, and metaphysical allusions carefully investigated and appreciated, parallel passages from English authors of different periods adduced, and the rules of composition in poetry or prose illustrated. As to the language itself, independently of the thought conveyed by it, investigations are conducted into the origin, value, and chronological history of the words, their formation, &c.; and in short, into everything which belongs to the domain of comparative philology. Nowhere else is the subject treated with equal competence and success."

plan has been carefully matured by the Board of Management, and placed on an extremely economical basis of expenditure. I must frankly say to you that we have undertaken more than our present resources will warrant. The College is not poor, but the growth of its work, and the constant pressure upon it for enlarged expenditures to carry on this work, necessitates the use of large sums of moneymuch larger, indeed, than our present income from all sources. income from students, as you probably know, is very small, owing to the immense number of scholarships sold during Dr. McLean's administration; -most of which are still available. This source of revenue barely suffices for the general miscellaneous expenditure. We are therefore mainly dependent, for the support of the Professors, upon the income from the permanent endowment fund. This, last year, was not quite \$17,000, and divided among the twenty-two members of the Faculty, does not afford a comfortable support, to say nothing of a fair remuneration for the learning and ability which college instructors are supposed to possess. The tutors receive only \$600, the assistant Professors \$1,000, and the full Professors from \$1,200 to \$1,600. Our endowment fund must be largely increased, or these salaries must be still further reduced. The Chair of Chemistry has been endowed by Mr. WILLIAM ADAMSON, of Philadelphia; and the Jessie Chamberlain Professorship of Botany by Mr. THOMAS BEAVER, of Danville. Who will help us, and honor themselves by endowing others?

ADDITIONAL BUILDINGS NEEDED.

Besides this addition to our endowment fund the College needs new buildings, as I mentioned in my letter to the *Presbyterian*, last week.

I said nothing then, and shall have nothing to say now, about a new Building for the Technical Courses of the Pardee Scientific Department; for though it is the most expensive of all our much needed improvements, it is among the least of my anxieties. There will be no appeal to the public for this. Only let it be seen that the general College Departments are provided for by the Presbyterian community, upon which, in all directions, are radiating from this centre of high education such manifold blessings, and we shall soon see rising upon College Hill a building that shall combine the best features of the

most celebrated Technological Institutions of this country and of Europe, fitted up with all the appliances of modern scientific culture, and every way worthy of the enlarged and comprehensive views of the munificent Founder of the Department.

But who will erect for us the other buildings that we have so long and so urgently needed?

1. THE CHAPEL.

First of all is the CHAPEL. I really have nothing new to say about this. The whole Synod knows that the old room we have so long used, both for recitations and worship, is every way unfit for a chapel. When the Synod met at Easton, four years ago, the committee to whom this subject was referred, made an earnest appeal that "some scheme be devised by which the entire Synod will unite in erecting among the new buildings now crowning College Hill, a MEMORIAL CHAPEL;" and upon their report, it was resolved unanimously, "that on the day of prayer for schools and colleges, or the week following, a collection be taken up in all the churches within our bounds for the purpose of commencing a fund for the building of a College Chapel." At the meeting next year in Danville it was found that this effort had resulted in securing the sum of \$360.21! That year, still stronger resolutions were passed, and a special committee of one minister from each Presbytery was appointed to carry out the plan. This second and last effort, after deducting the expenses, resulted in the additional sum of \$320.60! Meanwhile the old room has become still more crowded and uncomfortable; and as we now quite despair of securing this "Memorial Chapel" by resolutions of Synod, is there not some one Brother here who will undertake this special work in his own congregation; or can there not be found some one individual or family who, without waiting for others to act, will build this Chapel as his or their "Memorial before the Lord."

2. ADDITIONAL DORMITORIES.

These are imperatively needed for the largely increased number of students. All our college rooms are full, and it is almost impossible to get rooms in the Borough, within the means of our students, to say

nothing of the great inconvenience of ascending our high hill for recitations three times a day. Who will join with BLAIR and NEW-KIRK, and MARTIEN and POWEL, in building for our students convenient homes on College Hill?

3. A LIBRARY.

We are obliged to keep our books in a room which, like the Chapel, is used for daily recitations. There is even now not shelf-room for half our books, and how their number would increase if we had a suitable building to hold them! Who will erect it for us?

4. A GYMNASIUM.

Every good College ought to have a GYMNASIUM. We have long had the site for one marked out between Newkirk and Martien Hall, and we have recently elected a Professor for this special Department of Physical Culture, upon which the health of students so largely depends; but we are still waiting for some generous friend, who, fully appreciating the all-important subject of HEALTH, will place at our disposal funds for the Building.

5. APPARATUS, PRIZES, AND A BENEVOLENT FUND.

Then we need special donations for apparatus and models. We ought to have a few prizes for meritorious students; and we greatly need a permanent fund, the annual interest of which may be appropriated for the relief of worthy but indigent students. There may be some who have not sufficient means to endow Professorships or to erect Buildings, but they are honestly desirous of doing something for Lafayette. How I would like to meet and talk with such! These objects are as important as any I have mentioned, and donations for them, however small, will be gratefully received and the wishes of the donors faithfully carried out.

I have occupied more time than usual, Brethren, upon this important subject, for the reason I gave at the beginning, and because we cherish the hope that when the great work of the College, and its great wants are known to our people, this MEMORIAL YEAR of our Re-united Church will be a memorable year for Lafayette College, in

the generous addition it will make to its resources. It seems, indeed, as if it ought not to need the stimulus of a "memorial year" to secure for us the relief we need in the great work which the Church has given us to do; yet as the liberality of our people seems everywhere quickened under the stimulus of this five million fund, and as the General Assembly mentioned in its first resolution, "Theological Seminaries and Colleges" as appropriate objects, we believe that our appeal will meet with all the heartier response. This fund, I feel sure, is not to be altogether appropriated for building parsonages, or enlarging or repairing churches, or paying off church debts. All over the land I observe that Synods and Presbyteries are urging the claims of colleges located within their bounds. I hold in my hand a pamphlet, in which the claims of Hamilton College for \$250,000 of the memorial fund are presented with a force that must command attention, and which I hope and believe will meet with a generous response. I am pleased to learn that the first object placed upon the list for the Memorial Fund of the old First Church of Philadelphia, is the completion of the endowment for the Albert Barnes Professorship in Hamilton College. But, Brethren, shall nothing be done for Lafayette? A college not only located within the bounds of the Synod of Philadelphia, and under Presbyterian influence—having thus a general claim upon the Synod—but one solemnly received under your fostering care, all of whose Trustees and Professors hold their places by your official act, and to which, these many years, has repeatedly been given your pledge of sympathy and aid! If you are convinced that its pecuniary resources, though largely increased of late, are still utterly inadequate for its extended work, shall the great number of worthy objects which this Memorial Year has suddenly brought to the front make you overlook your own College? You are not called upon to found a new institution! Here is one, as this pamphlet says of Hamilton, "marked by the providence of God in its past history; rich in friends; provided with resources; baptized with revivals, and crowned with honor and usefulness." Located at one of the preaching stations of the revered David Brainerd, it has ever cultivated a missionary spirit-some of its students have found martyr graves in heathen lands. An unusually large proportion of its graduates

(nearly one half) are in the ministry; not a few of them occupying prominent and useful positions. Three are Professors in Theological Seminaries, and one was elected President of Princeton College. And then how beautiful for situation! Have you ever seen a more magnificent view than that from College Hill? It is not the least of the educational advantages in a four years course at Lafayette, that the student daily looks out upon a scene of such surpassing loveliness. Then its retired situation, so admirably adapted to student life, yet so central and easy of access from all parts of the country. Easton is three hours from Philadelphia, with eight daily trains; less than three hours from New York City, with thirteen daily trains; we have five daily trains to Scranton, and I know not how many to Harrisburg and Central Pennsylvania! It is proverbially healthy, and the cheapness of living, with the plain simple style which prevails among the community, makes the necessary expenses of a student at Lafayette comparatively small. It is the very place for a College—especially for one, most of whose students are obliged to practise economy, and so many of them candidates for the ministry.

And now, Fathers and Brethren, what shall be your response to all this? Through you I make one more solemn appeal to the Presbyterian community. Something may be done for the College beyond your bounds, in other parts of Pennsylvania, and in New York City, that great metropolis which pours its benefactions all over the land, but our main dependence is upon the region embraced in the Synod with which the College is connected. The providence of God has placed you with us in this important field. The reputation of Lafayette College is yours also. Men shall speak of it to your honor and praise if its work is well done, or to your reproach if otherwise. Nay, my brethren, more than your reputation is involved. There is your own conscience, to which I can make a higher appeal. Surely God shall set it over to your account, whether, through indifference or neglect, the College remains inadequately furnished even for its present work which you have given it to do, or whether, consecrated anew by your gifts and prayers, it shall be girded yet higher, and go forth to a still nobler mission to this and succeeding ages.





AN ADDRESS

BEFORE THE STUDENTS OF THE

Pardee Scientific Department,

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LAFAYETTE COLLEGE,

BY

ASHBEL WELCH, C. E.,

GENERAL PRESIDENT OF THE UNITED COMPANIES OF NEW JERSEY, AC., AC.,
MEMBER OF THE BOARD OF EXAMINERS OF THE PARDEE SCIENTHEIC DEPARTMENT OF LAFAYETTE COLLEGE.

DELIVERED AT THE OPENING OF THE COLLEGE YEAR, AUGUST 31, 1871.

LAMBERTVILLE, N. J.:
HAZEN & ROBERTS "THE BEACON" PRINT.

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1871.





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AN ADDRESS

BEFORE THE STUDENTS OF THE

Pardee Scientific Department,

IN

LAFAYETTE COLLEGE,

BY

ASHBEL WELCH, C. E.,

GENERAL PRESIDENT OF THE UNITED COMPANIES OF NEW JERSEY, &C., &C.,
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LAMBERTVILLE, N. J.:
HAZEN & ROBERTS "THE BEACON" PRINT.

1871.

Extract from the Minutes of the Faculty of Lafayette College, August 31, 1871.

"RESOLVED, that the thanks of the Faculty be presented to ASHBEL WELCH, Esq., for his Address, delivered this morning, before the students of the Pardee Scientific Department, and that he be requested to furnish a copy of the same for publication."

Young Gentlemen:

Within the memory of the present generation, the only pursuits in civil life considered suitable for educated men, were medicine, law, theology, and education.

But of late years there have sprung up among us, I will not say other *learned* professions, but certainly other *educated* professions, and among these perhaps the most important is that of the civil engineer, created by, and in turn assisting to develop into gigantic proportions, the great public works which form so striking a feature of this age.

The knowledge and control of the forces of nature, and their consequent utilization, now incomparably greater than ever before, have, to a large extent, been attained within my own memory. Some of the physical sciences especially, have had most of their growth within that period. For example, Chemistry has grown from infancy to at least a healthy adolescence. Geology has passed from a mass of isolated facts and unverified theories into a science. Arts of the greatest value and widest application, growing directly out of the most recent sciences, have originated, such as photography and telegraphing. Engineering resources and engineering works have increased to an extent of which the wildest fancy could hardly have dreamed.

I remember when I was a little boy, that an opponent of that great pioneer work, the Eric Canal, then just commenced, put his hand on my head, and said, expressing the opinion of a large minority of the people, "that boy will be a gray headed old man before the canal is finished." It was finished long before I had grown up; it reduced the price

of transportation between Lake Erie and the Hudson River from a hundred dollars per ton to ten, five, and, of late, even three dollars per ton; and in consequence, transferred the commercial supremacy of this continent from Philadelphia to New York; and then the public mind being absorbed by newer projects, this canal which had produced such great changes and given a great impulse to the country, was forgotten.

When I was a boy, learning to be an engineer, on the canal which runs along the valley of the Lehigh, there were two stage routes between this place and New York; one via Somerville and one via Morristown, over each of which one stage ran three times a week. I once started from New York on the wrong day, the stage coming no farther than Somerville. I got a ride in a farm wagon to White House, staid there over night, and next morning, there being no public conveyance, walked twenty-five miles with a heavy valise in my hand, over the Musconetcong Mountain to Easton.

Now on the railroads over those routes, there are about a dozen passenger trains each way per day, that is, there are now a dozen times as many trains, each prepared to carry over one hundred passengers, as there were then single stages, each prepared to carry ten passengers. Now we go in three hours, then it took all day.

When I commenced my engineering life, there were two railroads in America, one near Boston, built the year before, three miles long, and one at Mauch Chunk, just completed, seven miles long, making ten miles in all. Now there are more than fifty thousand miles of railroads in the United States; and they are increasing at an accelerated rate.

A prediction forty years ago, of one-quarter of what has since been accomplished, would have insured its author the reputation of insanity. In 1812, John Stevens, of Hoboken, (who had the misfortune to live a generation too soon), proposed to the Legislature of New Jersey to make a rail road across the State, and put on it steam wagons that should run twenty miles an hour. Our legislators shook their heads, and said it was a great pity so able a man should have such a streak of insanity.

Similar progress has been made in the branches of business contributing to, or dependent upon the railroad system; such as the implements stimulating agricultural production, and such as the coal and iron production, so strikingly seen in this once quiet valley of the Lehigh, now resounding with the clangor of iron making machinery, and the rumbling of coal trains. As much iron is now made in this valley, as was made thirty years ago in the whole United States.

But it is not necessary to dwell on that which is already the theme of every tongue.

In all this mighty progress engineers take a prominent part. Their position is one of great influence. It is estimated by some that railroad property is one-eighth in value of all the property in this country. It is controlled by a few hundred men, who also command hundreds of thousands of employees, and exercise a vast influence in the community.

It is important that those who are to have a large share in guiding this rapid progress and wielding this great power, should be well educated for it. And it was especially fitting that my old friend Mr. Pardee, my comrade for three years while we were young engineers, should for this purpose found, and so munificently endow this scientific school.* Let the result make the country feel its obligations to him.

As great changes may take place in your time, as have taken place in mine. Be prepared to act well the important part you may be called upon to play.

The early engineers of this country were seldom highly scientific, or very much book instructed. Thrown upon their own resources, their ingenuity and judgment and industry were taxed to the utmost. Some of them made up by hard study, the deficiencies of early education. Others seemed to see by intuition what most men find out only by scientific processes. The idle and incompetent were sifted out from among them, and they formed a very superior class of men. The experience of the old world was then so imperfect, and much of it so inapplicable to this country, that it often misled more bookish and less experienced men; so that those who depended mainly on local experience and their own skill and judgment, were by far the most successful.

But this state of things has passed by. What may be known as they found it out, and done as they did it, is not sufficient for the coming wants of the country. In the more refined engineering of the future, full knowledge of scientific principles and of all the general experience is essential. Local experience and good judgment were in old times better than all the book knowledge in the world, in making a crib dam across a river, or a tressel bridge for a railroad,

^{*}In 1866 Mr. Pardee gave \$120,000 for the endowment of the Scientific School; and in 1867, \$50,000 more. This year he gives \$200,000 for the erection of a building designed for the Department of Engineering in its various branches, and the Departments of Metallurgy and applied Chemistry.

but they alone are not sufficient in building a steamship, or an iron bridge of a thousand feet span. The experience and observation of any one man are too limited, his horizon is too narrow, and the principles he is to deal with too recondite and complex, to enable him to succeed in such constructions as will now be required, without a large amount of book knowledge.

The future engineer must therefore be scientific; well grounded not only in mathematics and mechanics, but in all those sciences which relate to the materials he uses or the operations he performs. All important, however, as this point is, I do not propose to pursue it further, nor to say anything about the particular studies which are most useful.

But science alone will not make an engineer without experience. In most cases, there are several different laws acting simultaneously, some contributing to a result, some acting against it; some unknown, some imperfectly known, and the exact force of each frequently uncertain; and the facts to which those laws are to be applied are often themselves imperfectly known. Among so many conflicting forces, and disturbing causes, and unknown quantities, experience alone can teach us what allowances to make, and what is the general result. As this is a point of great importance, I shall illustrate by some examples.

One of the standard mathematical books studied within my time, correctly reasoning from some of the facts, but ignoring others, taught that the strongest form of a beam was a triangular prism with the apex towards the pressure. Experience shows that form to be one the weakest.

A well known mechanical law requires the best proportioned beam bearing a load at rest equally distributed, to be

deepest in the middle. So scientific engineers at an early period made their rails deepest halfway between the supports, or fish-bellied as they were called. But experience soon showed that when not only these but even parallel rails broke, they broke not halfway between supports, but close by the supports; dynamic laws were found to have a more controlling influence than static, which had been at first alone considered. Nobody could tell beforehand without experience, the exact balance of opposing forces and considerations.

In the early days of railroads in England, the rails were laid on stone blocks, on account of their solidity and durability. The richest companies and most informed engineers here, followed the English example. But some of our self-taught, sagacious men thought that the cheapness, elasticity, adjustability and lateral steadiness of wooden crossties, made them preferable, and so adopted them. Others tried them as temporary substitutes for stone. Now they are found incomparably better than stone, and are used the world over. The poverty of the companies, and limited knowledge of the engineers, has sometimes proved an advantage.

In the case of the stone blocks, the dynamic considerations in science, and the difficulties of adjustment in practice, were overlooked or underestimated.

It is quite possible to be misled not only by the misapplication, wrong estimate, or neglect of a scientific principle, but by too exclusive attention to one fact, while neglecting others that influence the result. A very modern instance of this is found in that important item of an engineer's work, rubble masonry.

In old times we used to lay the outsides of a thick mass of

rough stone masonry in stiff mortar and the interior without mortar, and then grout it at every two feet in height, that is, pour in liquid mortar, made with cement, which if made to run rapidly in a large stream, perfectly filled all the minute interstices between the stones. This, when hardened, made the whole one compact mass like one stone, similar to the great artificial stones now so extensively made in France, of gravel and sand and cement. But scientific engineers found by experiment, that dry mortar adhered most strongly to the stones, liquid mortar adhering least of all. This fact unfortunately controlled the action of the next generation of engineers; they discarded grout and laid all their masonry in stiff mortar. Now, if in practice, all the interstices between irregular stones were thoroughly filled by this plan, as they might be if the stones were all rectangular blocks, then it would be all right. But the all important circumstance was overlooked, that it is nearly impossible to fill all the crevices between rough, irregular stones, in a thick wall, with stiff mortar, and also that both the contractor who furnishes the mortar and the mason who uses it, commonly have a motive for not forcing in as much as they might and that they can conceal the omission. The result is that the interstices between those irregular stones are not perfectly filled. Instead of every part of every surface being cemented to its neighbor by the hardened grout (of rather inferior adhesive force per square inch,) a large part of the surfaces are not cemented at all. Instead of every stone being so imbedded on every side that it cannot stir except with the whole mass, the stones may move inter se, and the wall yield in detail to a force that could not move the whole. And instead of the pressure of one rough stone on another in the interior of the wall

being distributed equally over the whole bottom of one and top of the other by the intervening material, the rough, irregular bottom of one bears on the rough top of the other only at a few points, which crush down and allow the interior of the wall to settle more than the face, and in doing so, to bulge and crack and weaken the whole.

In this case, the most important considerations were sacrificed to the least important, because the latter had been made prominent in standard books, written by men not fully practical. Hundreds of millions of dollars have been wasted in railroad construction under this error, even by some of our best engineers.

A century or two ago it used to be said with a great deal of truth, that the stability of a structure was inversely as the science of the builder. The cases I have mentioned (and engineering history is full of such), show how this is possible; and how a true scientific principle, or an important item of knowledge, may mislead; and how necessary it is to have experience as well as science and book knowledge. I mean continuous experience in the concrete, on the whole actual thing to be done, not merely experiments on its principles, or parts, or on particular things connected with it.

Those who have passed through scientific schools have sometimes erroneously supposed that when they graduated they were engineers. They may have been good materials, well prepared, for soon becoming so; but they were no more engineers than young men who have studied book-keeping are merchants, or those who have gone through a nautical school, sailors. Their error has always been in the way of their improvement, and sometimes led to utter failure.

What can and should be attained at a scientific school is

not engineering skill, nor so much engineering knowledge, but capacity for both. Science must be learned by study, many engineering facts must be learned from books, but their application must be learned by experience. They are not to be undervalued because insufficient alone, for no man can be a good engineer without them. So good eyes will not make a painter, but they are not to be undervalued on that account, for no man can be a painter without them.

In this country no man should be a mere engineer, attending only to physical means and ends. He should be able and accustomed to look at his work in its beneficial and financial relations.

Almost anything can be done. The straits of Dover can be bridged or tunnelled. But the real questions are whether it will pay, and if so, how it can be done most economically. Such questions are considered much more in the province of the engineer here than in Europe. No engineer, here at least, is justified in doing a work that will not pay, however magnificent, or with whatever skill, without expressing his opinion against it.

For example, suppose the question is whether to build a railroad bridge over a river or strait in place of a ferry. If it is decided that it will pay, then the question arises whether it shall be of wood or iron. Suppose the iron bridge will cost \$300,000 and last forever, without risk or repairs, and that money costs 7 per cent. Then the amount charged against the iron bridge is \$21,000 a year. Suppose the wooden bridge will cost \$100,000 and last twenty years, and that each renewal will cost as much as the original construction. Then we find by calculation that the present value of the cost of renewals forever, is about

\$33,000. The interest, on the first cost and the present value of renewals, is then something over \$9000. Suppose repairs, insurance, watching, &c., be enough to make the whole annual charge up to \$15,000; or \$6000 a year less than the iron bridge. Then the question will be whether the insurance against interruption of business by the iron bridge, is worth \$6000 a year. If so, it should be of iron. Such calculations as this should be familiar to the engineer.

An expensive kind of structure may be very proper in Europe, where railroad companies borrow money at four per cent. (doubling itself in seventeen or eighteen years), and very improper here, where the money borrowed by railroad companies costs them, on the average, full eight per cent., (doubling in eight or nine years). Many have erred grievously by following foreign precedents blindly, overlooking the above consideration, and also the fact that durable materials, as iron, are dearer here than in Europe, and cheap materials, as wood, cheaper here than there.

THAT IS THE BEST ENGINEERING WHICH ACCOMPLISHES THE PURPOSE MOST ECONOMICALLY.

The purpose may be utility, or in part ornament, or something else, of the propriety of which those only who are to pay for it should judge.

The economy must be ultimate, taking into consideration rates of interest, renewals, risks, interruptions, repairs, attendance, watching, chance of becoming obsolete, or of being disused on account of change of location, and the like.

Work is sometimes done unnecessarily expensively. For example, in some situations railroad masonry of dressed stones, that has cost twelve dollars per cubic yard, though theoretically and in itself better than masonry of rough

stones, that would have cost only half so much, yet is practically no better, for either would answer the purpose. The present value of the difference between the cost of renewal in one century or two centuries, is not one tenth of one per cent.

Employers have before now been ruined by *splendid* engineering, but it was not *good* engineering, for the result showed that it was too costly for its purpose. Magnificent errors sometimes give popular applause for the moment, but not the applause of the profession nor of employers.

The mere scientific mechanic may use a great deal of skill and science to attain certain physical results, without regard to cost or profitableness. The good engineer aims not only to attain his results by the best means, but to attain only such results as will pay.

In order to judge whether his works will pay, and what ultimate economy requires, the engineer must understand the operations to be performed on them, and the interests connected with them. A considerable amount of knowledge of collateral subjects is therefore necessary.

While everything is changing so fast, we should not build expensively for perpetuity. A thing right now, may be wrong in the future. Changes in locations, in the modes of operating, in circumstances a thousand ways, may take place. For example, the locks on the Erie Canal were built in the most expensive manner—to last forever. Very soon they were behind the times, and now they are the great obstacles to the improvement of that important work.

Engineers have no right to build monuments to perpetuate their own names at the expense of their employers. Instead of monuments of their skill, they become really monuments of their short sightedness.

An engineer's capital in business, consists of his ability, arising from science, knowledge, experience and brains, his industry, including with it health and endurance, and not least, his character for integrity.

An engineer, to succeed, must be a laborious man. He must not only study science, but when necessary, roll up his sleeves and not be afraid of the smutch. If you don't intend to work hard, go at something else.

Men who place property and business of great value in the hands of others, will, if they are wise, select those who are known to be honest, and pay them whatever they must, to secure their services. If the circmstances are such that a dishonest man might steal many thousands a year, it is wise to give an honest man a few hundred a year more salary, by way of insurance against stealing.

The dishonest agent wastes more than he steals. To put a thousand dollars into his own pocket, he takes several thousand out of the treasury of his employer. He buys unnecessary things on which he gets a commission, or has unnecessary work done out of which he somehow makes something. He thus throws away ten thousand dollars of his employer's money to make one thousand for himself. To allow an employee to make up the deficiencies of his salary by helping himself, is an expensive mode of payment.

The interests put into the hands of engineers are becoming greater and greater; there is more and more to be stolen; and employers are beginning to see that it is wise to pay well for the insurance against fraud derived from character for integrity. I think, therefore, that such character will be hereafter of very great pecuniary value.

No system of public works, or business of any kind, can exist without the public confidence, founded on integrity

of agents. An eminent English engineer once told me that a then late prime minister of a great continental government had recently expressed to him the opinion that they could not have railroads in his country, for they could not find a board of directors with whom capitalists would trust their money. Whether or not the ex-minister was right then, his statement would not be correct now, for there are both confidence and railroads in that country; but it illustrates the absolute necessity of confidence and, therefore, of integrity.

The higher the tone established among engineers and railroad managers, and consequent greater public confidence, the more railroad construction will be stimulated, and the better these engineers and managers will be paid. It is gratifying to know that, so far, the engineers of this country have been singularly free from charges of dishonesty, notwithstanding the great temptations in their way. The high moral tone of the engineer will also give social standing. It should be cultivated, not only for other and higher reasons, but because it is so large a part of the engineer's capital. And as engineers have more influence than an equal number of almost any other class of men, their character is of great moment to the community. The moral training of the engineer is therefore more important than even the scientific. And if Washington was not mistaken when, in his farewell address, he cautioned us against "the supposition that morality can be maintained without religion," and if it follows that the young engineer should have religious principles inculcated, I cannot help it. I am sure the Faculty of your college have arrived at that conclusion.

One question of personal importance here presents itself: Will engineering hereafter pay? Or will so many engineer factories spring up as to flood the profession? For many years it was a common impression that all the good routes would soon be so fully occupied that railroad construction would stop, and engineers have nothing to do. But it has turned out that railroad constructions have gone on with accelerated pace, and the demand for engineers has been increasing.

As the works in charge of engineers become more and more valuable, and the interests entrusted to them more and more important, the demand for skill, industry and integrity will increase. Where millions may be gained or lost by good or bad, honest or dishonest management, judicious employers will not fail, for a few thousands, to secure the best men. Such will be in greater demand, and better paid, whatever becomes of the rest.

Those engineers will alone succeed who work hard. This will sift out a great many, and reduce the number of competitors for employment.

An engineer's education and experience embrace or are related to so many things, as in some degree to enable him to turn his hand to anything. So, if he fails to get employment in his proper line, he is partly prepared to do something else.

Railroads are increasing rapidly in countries which look to this for their engineers and managers. The American engineer is better qualified for most other countries than the European. That will open a wide field for employment. I had a young man on the railroad, along the valley of the Delaware, past this place, who some ten or fifteen years ago, after he left, wrote in acknowledgment of a recommendation I had given him, that he was on a railroad in the Island of Ceylon; and a son of one of my old comrades is now building railroads on the banks of the Ganges.

Every occupation has its own good tendencies, and its own sins. Let us look at one of the good tendencies of the occupation of an engineer.

In some kinds of business the immediate object of each transaction, always before the mind, is one's own pecuniary profit. This tends (though with a force that is often resisted), to avarice and selfishness. But the engineer, though his ultimate objects may be pay and reputation, may not think of those objects for weeks and months together, for his attention is occupied by something useful to others. His immediate aim is the public benefit, that is to benefit his employers, and that (three removes off) gives him his pay. So his pursuits tend to make him unselfish.

Like the guilds of the middle ages, many kinds of business are conducted too exclusively in the interests of those engaged in them. Their knowledge is illiberally concealed. Competition is fought against. But the engineer habitually aiming at public utility, naturally becomes liberal. It is as discreditable for him to conceal a discovery, as for a doctor. It is as important to his reputation as to that of the man of science, to announce his discovery, if he makes one, before somebody else makes it too.

There are two ways of getting rich, one by creating wealth, the other by getting it away from somebody else. One man, by his skill and labor, converts a worthless sand bar into a fertile field, and so becomes (or perhaps makes somebody else) rich; another wins his neighbor's money at cards, or by a Wall street corner. Society is indebted to the first; of the last I say nothing.

It is a source of congratulation, that he whose honored name is borne by your scientific department, became rich by producing wealth; and so did the other benefactors of the institutions in this beautiful valley of the Lehigh, Packer, and Adamson, and Beaver, and Scranton, and Blair, and Jenks, and others. In old times, as you may read in the good book, the sacred treasury would not receive gifts from dishonorable sources. Such gifts canker and corrupt, and become a curse. From this you are free.

Now it is the business of the engineer to create wealth, by devising, laying out, superintending, and sometimes operating, works which have the greatest utility at the least cost, and by his skill to prevent unnecessary labor and enable necessary labor to produce the largest results.

The laborer who does the work, sometimes complains that the officer who looks on gets several times as much pay as he, and does nothing. To prevent this complaint from being just, the officer must contrive to make the labor much more effective than it would have been without him. His brain must save the laborer's muscle.

Let us glance at the engineer and his works as associated with science, capital and labor.

The engineer is nearly related to the man of science on one side, and the practical mechanic on the other. In the army of labor he holds the highest executive position, though there are strategists above him. It is important that the lines which separate these grades should be understood and not often passed.

The man of science aims at truth for itself. His province is to discover, not to apply. If he is diverted from his pursuit by a question about the utility of his discoveries, he may drop some that would turn out most useful. If the astronomer who first studied the motions of the moons of Jupiter, had stopped to consider the utility of his labors, he would probably have given them up; for nothing could have seemed more remote from any human interest than those insignificant attendants of a distant planet; but the result of that investigation, and such as that, is the safe navigation of the ocean. When Oersted, half a century ago, was spending his time watching a needle under a wire, it must have seemed to a spectator of very little consequence whether it quivered to the right or the left, and Oersted himself could hardly have expected any great utility from his investigations—but among the results is the telegraph.

It is enough for the philosopher to know that all science is useful.

The engineer's aim, on the other hand, always is utility; his means, science. If he remains too long in the higher field of mere science, he is in danger of losing the habit of keeping his eye fixed on utility. He will become too speculative, and he will get into the habit of aiming only at physical results by skill and science, without regard to cost or return of profit.

The world is more indebted to the philosopher who discovers than to the inventor who applies; not only because the discovery requires a higher grade of intellect, and because the discovery once made, if one inventor does not apply it another will, but also because the inventor gets pay in money, the discoverer does not.

The interests with which engineers have to do, so ramify among and anastomose with other interests, and among different classes of men, that he should be able fully to comprehend their relations. The many instrumentalities for the production and transportation of property, are becoming more and more parts of a single great system, formed of capital and labor. The engineer should study this system which he is, in part, to direct.

Labor is performed less and less by animal power, and more and more by the power of inanimate nature, especially steam. Human labor is less and less by muscle, and more and more by brain in directing the forces of nature. Knowledge is not only power, but pay. Brain labor, among practical working men, commands two or three times as much pay as muscular labor. A locomotive engineer who works with brain and eye, gets more than twice as much wages as the man that only digs, or strikes, or lifts.

Now the more a laboring man is compelled to use his brain the more he is elevated. In order to work his engine, or machine, or mixture, properly, he must know, and reason upon, and apply, some science. He learns to think. Hence, by the greater amount of brain work done.now, the average working man of to-day is far superior to the average working man a generation ago. With improved moral conditions, which happily exist, that mental elevation is a great blessing: During my early experience, it used to be said that the laborer of a certain nationality "must be at work or drunk." Among the same class now you find much of skill and worth, and drunkenness is becoming the exception. Men are becoming equalized by levelling up. In the future, there will be no place for laborers half man half brute.

The intelligent working man now sees that he is not a unit that can prosper when others do not, but that every man is part of a great system, and must prosper or languish with it. He sees that a strike in one place, or branch of business, paralyzes everything else and injures everybody else. He sees that he is more injured by this than by the avarice of the capitalist, who may refuse to give him a fair share of the joint product of capital and labor.

As the great machine becomes more and more compact, and its elements more unified, the interest each part must feel in the success of the whole must prevent such suicidal conflicts as we have sometimes seen. This interest is like that of a sailor in his ship—if it sinks he must sink with it. When the possessors of both capital and labor become enlightened, the respective prices of each will be regulated peaceably by supply and demand.

The engineer is, to some extent, the arbiter between employers and employed; he should understand their relations and do all he can to promote justice and harmony between them.

Public works and their managers are sometimes in conflict with the public. This is impolitic and abnormal. The interests of those works are best promoted by making them most beneficial to the public.

The works of engineers, especially railroads, are important instruments in the civilization and christianization of the world.

They assimilate mankind, break down the barriers between nations, sections, clans and castes. A curious indication of this is seen in Switzerland. Twenty years ago there were no railroads in that country. The costumes and dialects of each canton and district, differing from all others, had been fixed for ages. Now there are six hundred miles of railroads in the Confederacy. The cantonal costumes have

begun to be modified or compromised, and among some of The broad, black frill of the the young people, disappear. Bernese cap is not so flaring. The Vaudois peasant woman sometimes travels without her tall basket on her back. The once inevitable red handkerchief does not so universally grace the heads of the fair haymakers of eastern Fribourg. These straws show how the wind is moving more important things. For a long time the Swiss have seen many strangers without imitating them. They have clung to their old patois and costumes and usages. But as soon as railroads induce them to travel themselves, among each other, they begin to change, to take the complexion of things around them. And so by means of railroads, mankind everywhere assimilate. Even Asiatic fossilism is giving way.

Whether the assimilation of mankind, their concentration into one great community, their enormous power over nature, their partial release from gaining their bread literally by the sweat of their brow, their greatly increased leisure and knowledge and mental activity and force, will be for good or for evil, whether all this progress will be a blessing or a curse, will depend on the amount and quality of the religion that prevails. It should therefore be the first aim of every well wisher of his kind, to spread pure Christianity, and elevate the moral tone of the world.

If there is anything in the conjecture of some, that antediluvian longevity, and with it concentration, and growth in arts and knowledge, and power badly used, led to that depravity which could only be removed by a universal deluge, it should caution the world now to be incomparably more anxious about moral than about material improvement.

That five per cent. of the human family who speak the

English language, called for short, after its dominant element, the Anglo Saxon race, have more power, wealth and apparatus available for civilizing the world, than all the rest of mankind together. One reason and indication of this is, that they have more railroads than all the rest of the world together. The United States containing less than three per cent. of the inhabitants of the world, has more than forty per cent. of its railroads.

Others may have more absolute wealth that we have. But in their hands it is not available to influence the world. The German capitalist lends us his money, we build railroads with it, and in our hands it becomes power.

Modern science and art give almost absolutely all the power that man has over man, to the small minority who compose the civilized races, and even to a small part of them. A few thousand white men in India govern an eighth part of the human race. And the engineer manages those things in which this power largely resides.

The Anglo Saxon race, especially the American branch of it, is bound by this immense power, which Providence has placed in its hands, to exert itself to civilize and christianize the world; not by means of conquest or annexation, but by peaceful and moral means.

Railroads and steamships cannot make men Christians, but they can form a highway over which Christianity may pass. Arts and sciences cannot change men's hearts, but they can break down many barriers surrounding those hearts, and secure for Christianity a favorable hearing. Though their immediate object is material utility, their moral effect is the most important. The engineer is the ally of the missionary; and if he fails to recognize himself

and his works as part of the machinery used by Heaven in that sublime movement now commenced, by which the world is to be regenerated and peace on earth and good will to men established, he fails to appreciate his position. English language, called for short, after its dominant element, the Anglo Saxon race, have more power, wealth and apparatus available for civilizing the world, than all the rest of mankind together. One reason and indication of this is, that they have more railroads than all the rest of the world together. The United States containing less than three per cent. of the inhabitants of the world, has more than forty per cent. of its railroads.

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AN ADDRESS

BEFORE THE STUDENTS OF THE

Pardee Scientific Department

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LAFAYETTE COLLEGE,

BY

P. W. SHEAFER.

MEMBER OF THE BOARD OF EXAMINERS OF THE PARDEE SCIEN-

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JUNIOR UNIVERSITY.

COLLEGE YEAR, SEPT. 5, 1872.

EASTON, PENN'A.

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EXTRACT FROM THE MINUTES OF THE FACULTY OF LAFAYETTE COLLEGE, SEPTEMBER 9, 1872.

"Resolved, That the thanks of the Faculty be presented to Mr. P. W. SHEAFER, for his Address, delivered last Thursday, before the students of the Pardee Scientific Department, and that he be requested to furnish a copy of the same for publication."

Printed by ALPRED MARTIEN, Philadelphia.

Young Gentlemen:

The subject which will engage our attention for a short time this morning, is the remains of the great tropical forest, which in remote ages covered so large a portion of our Continent, having for its eastern boundary, perhaps, our South Mountain (a part of the Blue Ridge chain,) and thence stretching westward far beyond the Mississippi, while its range north and south extended from the Lakes to the Mexican Gulf.

The age of the coal-deposits is one of those serious problems which we may say are past finding out. We cannot even guess at it within a million years. But we can fix the relative age of our "black but comely" giant. It is one of God's latest, as it is one of His best gifts to man. It is much younger than gold and silver, younger than iron or any of the baser metals, younger than the precious stones, younger than coal-oil—which comes from the shales below the coal—younger even than the limestones, those wonderful remains of animal, as coal is of vegetable lifeexcept the few layers which are found among the carboniferous rocks. How young, and yet how amazingly old is our King COAL! Even after the lapse of countless ages had laid the foundation and prepared the bed for the mighty forests of the carboniferous era, millions of years must have been required for the growth of those forests, their decay and submergence, the deposition of their slaty covering, the growth of new masses 1

of vegetation, and the rotation of this slow machinery during all the process of forming the twenty or more beds, small and great, of the Anthracite series; together with the interstratified sandstones, limestones, shales, conglomerates, etc., all of which were formed by the slow process of deposition, and all of which tend to render more hopeless the effort to conceive of the length of time required for the formation of this single group of strata.

The "Mammoth" bed of Schuylkill county, after having been compressed until almost crystallized, and until the growth of a generation is reduced to little more than a film, still averages twenty-five feet in thickness, over a territory nearly one hundred miles in length, and must, alone, have required ages for its production, even allowing, as we must, for the rapid and continuous growth of a tropical forest.

That the coal deposits are all, comparatively speaking, of the same age and formed in the same way, is shown by the remarkable uniformity of the fossil plants found in them. These are identical, not only in all the Anthracite and Bituminous coals of the United States and the British Provinces, but even in England and on the Continent of the Old World.

We magnify the importance of Coal in our country; first, because of its value as a fuel; and, second, because of the vast supply stored here. The first point no longer needs demonstration. Since that day in 1812, when the workmen at White and Hazard's

nail-works, at the Falls of Schuylkill, left their furnaces in a rage because they could not make the "black stones" burn, and returned to find that during their absence they had nearly melted down the furnace doors, Anthracite Coal has stood without a rival upon Practical as well as analytical tests have failed to find an acceptable substitute. Neither wood, nor peat, nor oil, nor any other substance contains pure carbon in so condensed and cheap a form, says Professor Jevous; and Professor Tyndall adds: "I see no prospect of any substitute being found for Coal as a source of motive power. We have, it is true, our winds, and streams, and tides; and we have the beams But these are common to all the world: of the sun. we cannot make head against a nation which, in addition to these sources of power, possesses the power of Coal."

Prof. Tyndall further says: "We should have, in my opinion, no choice whatever in a race with a nation which, in addition to abundant Coal, has energy and intelligence approximately equal to our own,"—a significant admission from an authoritative source. England must soon yield to America in the great competition of the nations. The strength of both is in their coal mines, and in England these have already reached nearly or quite their maximum of production, while our Anthracite is but partially developed, and our Bituminous Coals are scarcely touched. The great body of our present coal supply lies within five hundred feet of the

surface, while the depth to which English miners are obliged to go is best seen from a statement of their principal shafts:

The Houghton Pit is 780 feet in depth.

The North Seaton Pit is 744 feet in depth.

The Ryehope Colliery is 1,680 feet in depth, and the Dunkenfield was sunk to a depth of 2,060 feet, at an expense of \$500,000 in money and ten years of time, mainly to reach the "Black Mine Coal," a bed 4 feet 8½ inches thick. Compare this with the "Hickory Shaft," near Pottsville, the deepest working shaft in America. This shaft, which is 666 feet deep, cost \$100,000, was sunk in 428 working days, and developed 76 feet of coal.

The English people are now discussing the probable depth to which they can follow their coal seams. Professor Jevous "shrinks from endorsing the 4,000 feet theory," but stops short at 2,500, and says when they reach that depth a complete supply of coal will come in from Pennsylvania. We have superior advantages in working our Anthracite coals, from the inclination of the beds and their consequent cropping out on the surface. We find solid coal within twenty to fifty feet of the soil, and sinking our slopes in the coal itself, at a cost of not more than \$100 per yard, exhaust the first set of coal chambers, and then, sinking one hundred yards deeper, make a new set, and so go on until we reach the bottom of the basin. This is far cheaper and more expeditious than the deep

shafts which the English are obliged to sink vertically through hard rocks, intercepting all the water courses which lie between the strata, and thus adding a heavy expense for drainage to the dead loss of capital in removing unremunerative material. The great Monkwearmouth Pit was only completed after twenty years' labor; our energetic Americans sink their slope, build a breaker, put up miners' houses, pumps, engines, etc., in one year, and the next are shipping coal.

A good idea of the extent of our Anthracite resources may be gained from a single illustration. The Mahanoy Valley, in Schuylkill County, Pennsylvania, is about twenty miles in length by half a mile in width. In this area there are twenty-five collieries, and these will produce, on an average, 2,000,000 tons of coal annually, for the next fifty years. All this from a single synclinal trough containing about one-fortieth of our Anthracite coal area.

But though Pennsylvania's store of Anthracite will last for many years, and long after it is drawn upon to supply England, it is useless to deny that there is a limit to the supply, and that, after a time, it will be exhausted. Then what shall we do?

We shall proceed to open the grand reservoir, the Bituminous coal-fields, compared to which our Anthracite beds are but as a mill-pond to the Gulf of Mexico. With a Bituminous area of 12,000 square miles in Pennsylvania, and 197,000 in the United States, we can supply the world with fuel for ages to come.

And after the Bituminous, what? Brown coal—Lignite—that queer, woody-looking mineral, little known as yet, but already beginning to be used, and destined to play an important part in the world's great drama, long ages hence. With this, as with the other coals, America is still the favored land. It is found from Behring's Straits to Salt Lake City, and again, in Tehuantepec, Panama, Peru, and from Chili to Patagonia. But it also occurs in many other parts of the earth. It stretches in almost a continuous belt across half the world, from France to China. It is found in Australia, Van Dieman's Land, Sumatra, Borneo, and probably in many other countries where the bowels of the earth have not yet been explored.

So we shall not lack for fuel very soon. The main point, however, is that Pennsylvania holds the key to these vast store-houses of fuel, and consequently to the workshops of the world. Her supreme command of the world's supply of Anthracite, and her rich deposits of iron, give her a prestige which she will never lose.

Widely distributed though the coals and metals are, a glance at a map of the world on which their areas are defined, will show how insignificant is the space they occupy, when compared with those parts of the earth from which they are absent. It has always been the case that the nations best supplied with these treasures, and which knew best how to use them, have held the commercial supremacy of the world. Where

these truly "internal resources" go, wealth and influence are sure to follow. The distribution of fuels is almost entirely, and that of metals to a great extent, in the northern hemisphere; and the northern hemisphere is the field in which all the arts and sciences are cultivated. In the United States, a belt four degrees in width, say 258 miles wide and 2,600 long, containing 670,800 square miles, say but one-fifth of our total area, having for its medial line the fortieth degree of north latitude, and running from the Atlantic to the Pacific, embraces the most of the great coal and ore beds; and it is precisely within this belt that the main railroads and canals, the Pacific road from Omaha to the Sierra Nevada, the great centres of industry, the principal commercial and manufacturing cities, are to be found. New York, Philadelphia, Pittsburgh, Columbus. Indianapolis, Springfield (Illinois), Denver, and Salt Lake City are all nearly in the middle of this belt; while Boston, Chicago and San Francisco are just outside of it. The fortieth degree of north latitude may indeed be called the backbone of the United States, and Pennsylvania, holding a central position on this belt, with one hand on the inter-ocean highway of the nations and the other on the magnificent river system of the Mississippi Valley, having her lap filled with the country's choicest mineral wealth, well merits the proud title of the Keystone State, for she both binds and crowns the Union.

With the appliances of modern chemistry we can so condense an ox that he can be carried in a handbasket, and so to-day we find a mighty tree of a past era reduced to a scuttle of coals. We find the sunshine of the past concentrated in a tropical growth, and long stored up in the hidden places of the earth, now lighting all our houses, its heat driving our locomotives with the speed of the wind and carrying our burdens with the strength of an army of giants. Think of a single locomotive performing in a day the work of ten thousand camels on the Arabian sands! Well may we be thankful for these vast granaries—so well filled by our Joseph, during the years of plenty, that when the lean kine devoured the forests that were on the earth, and the years of famine came, we had abundance in store for all the nations.

It is so well located, too, this power-treasure of ours; placed near the great centres of commerce, with a Divine foresight that just here it would be most needed; river channels opening for it pathways to the sea; mountain walls cloven asunder to lay their black diamonds open to the miner's hand; and again, that the whole land might share in the blessing, vast deposits underlying the western plains, where no forests wave and man can find no other fuel.

Nor must we think of this warmth-and-light-giving coal as a creature comfort only. It preserves the life and energy of nations. Professor Tyndall says the destiny of the English nation "is not in the hands of

its statesmen, but in those of its coal owners; and while the orators of St. Stephen's are unconscious of the fact, the life-blood of the nation is flowing away." The fearful amount mined from English soil gives that nation no little concern; so much, indeed, that one of its writers is constrained to offer no better consolation than this: "Economy will reduce our consumption; the burning of waste heaps of coal will be stopped. America will relieve us from the world-wide demand for our coal, and will, eventually, furnish this country with as much as we want." Let us see, now, how the coming demand upon America's resources is to be met.

In our estimates of the areas of the Anthracite coal fields of Pennsylvania, we place that of the

Total, . . 470 square miles, or, 300,800 acres.

Averaging the total coal thickness of the Southern coal field at 75 feet, and that of the Middle and Northern fields at 45 feet, we have a total content (one cubic yard equalling one ton) of, say, 26,361,076,000 tons Deduct one-half for waste in

mining, preparing, and faults, 13,180,538,000 tons.

and we have a net result of 13.180.538,000 tons.

The amount mined from 1820 to 1870, the first fifty years of the Anthracite coal trade, was 206,666,325 tons; so that we have yet in store 12,973,878,675 tons.

The progress of our coal trade is thus shown:*

In	1820	the production	was		•	365	tons.
From	1820	to 1830,			533	,194	".
	1830	to 1840,			5,406	,711	**
**	1840	to 1850,	•		15,952	2,893	44
"	1850	to 1860,			42,088	6,644	"
. 44	1860	to 1870,			50,337	',35 4	44

To estimate the future consumption, we must also consider the increase of our population.

In 1830 our population was nearly thirteen millions, (12,866,020;) the consumption of Anthracite being at the rate of one ton to twenty-four persons.

In 1840 the population was 17,069,453, and the consumption one ton to three persons.

In 1850 our population was over twenty-three millions, (23,191,876,) and the consumption not quite one ton per capita.

In 1860 the population was over thirty-one and

^{*} See the valuable diagram prepared by Mr. Sheafer, and appended to this address. The Trustees of the College also take this opportunity of expressing their obligations to Mr. Sheafer for his donation to the College of the series of valuable models prepared by him, exhibiting not only the coal beds of the Anthracite region, but all the prominent physical features of this section of our country.

a half millions, (31,641,977,) and the consumption about two tons per capita.

And in 1870 the population was thirty-eight and a-half millions, (38,555,983,) while the consumption of Anthracite coal had reached a ratio of three tons to each individual.

The consumption during the last decade hardly equals our expectation. From 1840 to 1850, it increased 15,952,893 tons, or at the rate of one and three-tenth millions per annum. From 1850 to 1860, the increase was 42,088,644, or three and five-tenths millions per annum. From 1860 to 1870, the increase was 50,337,354, or four and two-tenths millions per annum.

At the rate of fifteen million tons per annum, our supply of Anthracite Coal alone will last two thousand six hundred years; the English at its present rate of consumption—say one hundred million tons a year—will be exhausted in one hundred and thirty years. Their area has five thousand four hundred and nineteen square miles; about one-fortieth of ours.

We have hitherto been chiefly considering the Anthracite Coal. We must now turn our attention to the vast expanse of our Bituminous fields, of which Professor Rogers estimates that the United States contains not less than one hundred and ninety-six thousand eight hundred and fifty square miles, or about nine-tenths of the known coal area of the world. One of these coal fields extends from northeastern

Pennsylvania to Tuscaloosa, Alabama, a distance of eight hundred and seventy-five miles, with a maximum breadth of one hundred and eighty miles; making an area of fifty-five thousand five hundred square miles. "Comparisons are odious," oftentimes; but we cannot resist the temptation to make another just here: The coal-fields of the British Provinces

Total, . . . 213,433 " "

The British coal area equals five thousand four hundred and nineteen square miles; their production of coal has doubled in the last twenty years, and is now increasing at the rate of 2,750,000 tons per annum; while their estimates of its duration run from one hundred and seventy-two years upwards. With the exhaustion of their coals they sink deeper shafts; and these, with their labor troubles, and the great emigration to our shores, which renders competition less keen among the workmen —all tend to make coal mining in England more expensive, year by year. In view of these facts we anticipate an encouraging future for our coal trade, even at this hour of its depression. We can almost realize the time when we shall export coal for the world's supply; when the vessels of all nations shall throng our wharves; when we shall not compete with pauper labor; when our home consumption of coal for the manufacture of iron shall assume gigantic proportions.

For why should we not manufacture as cheaply and as well as any other nation on the globe? We have more abundant resources than any; and all that is lacking is their proper development. The total product of our Anthracite and Bituminous mines now is but one-fifth that of England; her export alone for one year being nearly equal to our entire production of Anthracite for the same year. For centuries the British Isles have been the great storehouse for the world's supply of coal, iron, and other minerals. Their coal mined in 1870 exceeded one hundred and ten million tons, while our whole production of both Anthracite and Bituminous was but twenty-five millions. Their production of iron ore was fourteen million tons, and of pig iron nearly six millions, while our production of pig iron was less than two millions. We used in 1870, a little more than one million tons of railroad We manufactured 620,000 tons, and imported 470,000 from England. Our total importations for 1870 amounted to \$43,000,000. But while we are constantly growing stronger, England is as steadily growing weaker, and the contest for the manufacturing supremacy must soon terminate in our favor. Since the wages of the British miner have been increased and his hours of labor reduced to fair rates, the production of the English mines has decreased while its

cost has increased; besides, the future development of their coals will be more expensive, as they are obliged to sink deeper for them. Their product will now diminish, while ours will increase. The one item of cheap labor has long retarded the full development of our resources; now the tide has turned, and our nation is going forward with rapid strides. Our ships crowd every port, our canals reach every valley, and our railways are as numerous as turnpike roads. Already we have one iron link fastened at either end on the Atlantic and Pacific coasts and two others well under way, striding through the wilderness, bearing light and civilization to the now shadowy lands.

What thoughtful man will not make the contrast, when he considers our vast resources of Bituminous Coal, so widely spread; our Anthracite so concentrated in one State, near the seaboard; the iron ores of Lake Champlain on the one hand, those of Lake Superior and Missouri on the other, and the hematite and fossiliferous ores of Pennsylvania and the Franklinite of New Jersey, close at home—all gravitating toward a common centre, where lies the coal to fuse them. Considering these, and with them our limestone valleys, our forests of timber, the oil districts of Western Pennsylvania, and our railroad and canal systems—it needs no prophetic vision to mark the spot where the workshops of the world will be. Shall we place them far North, far South, far West,—or at a point of ready access to our great seaboard cities; easily reached from

all points by both rail and canal; on the great route of travel from the Pacific coast,—the route over which come alike the gold and silver of the far West, and the teas and silks of the far East? We venture the prediction that we do not stand to-day one hundred miles from the spot where the London and Liverpool of this continent will be. A giant power, uninfluenced by political parties, will place them where the elements which shall constitute their greatness are readily found and cheaply gathered for manufacture and distribution.

To build up our future metropolis we must have good and plentiful materials and cheap transportation. We must exact good work, and to secure it, must pay good wages, and not oppress the workman with exhausting servitude. Neither must he dictate what his wages shall be; for his labor he must receive a just recompense, and no more.

Another element required to build up our nation's greatness we must consider to-day. We must, above all, possess an intelligent and skilled direction and directors. In vain do we gather multitudes of men for war, and send them in confused masses against the enemy. Unless we marshal them under well-skilled leaders, they will accomplish nothing. To-day, LAFAYETTE COLLEGE and other institutions all over our land, we are proud to say, are equipping and preparing skilled officers to do effective service. Let each act well his part. With intelligence and indus-

try each man is sure to make his mark,—to take his place, and help on the great work before us.

Do you ask, what is this work? Look about you It is the work of carrying on the world. It is the work of ennobling the world. must make it better and purer and holier for our having lived in it. The old theory of successive ages of gold, of silver, of bronze and of iron, was all wrong. In the "golden age" of the ancients their ancestors were wandering, half naked, through interminable woods, killing with flint lances the wild animals on which they fed, roasting them before a rude fire, fighting among themselves for the largest share, and when the flesh was consumed, cracking the bones of their prey to get at the marrow. The golden age has never existed. We have only just passed the age of wood, and entered upon that of iron, and it is our mission to extend and exalt its sway. The control and use of coal and the metals are but arts of civilization, nor do we stop at their ordinary use. We must not expect to plod in the old, deep-worn paths, but ever strive after the Excelsion. Every thing must be made better, quicker, cheaper. The first watch was a great achievement, but how much better we make them now. Were we satisfied with a fast line of coaches, at ten miles an hour? Are we to-day content with the locomotive, at thirty or forty? Do we not hope that better perfected materials and machinery will one day carry us one hundred miles an hour with no more

danger? We daily see animated machinery no larger than a man's hand, but made by the great Artificer, cleave the air at the rate of sixty miles an hour; or, as in the case of some carrier pigeons, even one hundred; and shall we stop short of this degree of perfection? The strength of our machinery on land exceeds that of Nature's; then why not imitate her in the air, and on the waves, or under them? Nature's machinery can overcome the resistance of the elements, why cannot ours? Have the telegraph, photograph and telescope, reached the limit of their powers? We think not fully, nor perhaps, nearly. We have quick transmission of thought and faithful reproduction of feature and form; but we are not yet able to place the miniature landscape in all its gorgeous tints upon the photographer's plate, nor can we yet dispense with the slow old method of type The electrotype, as yet, is only applied to a fraction of its future uses. The telegraph strikes one note; why not make it transmit harmonious melody? All these things are still waiting to be done.

The great treasures of Nature's arcana are but partially explored. The last hundred years have opened much to our view; where will the next hundred place us? Are all the coal fields explored? What will the interior of Africa reveal? We need more iron, to supply the world with a set of rails for every road; myriads of iron ships for every sea, besides ships for the air. We need a more speedy method of tunneling

through Alpine heights. We need to have air made as subservient as gas or water, to be carried in pipes and made to blow a whirlwind blast or flutter a lady's fan. These are but glimpses of a few drops from the ocean of knowledge which still remains to be explored.

Reviewing the past and with prophetic ken anticipating the future, we see that a small portion of the universe has been imperfectly developed. Nature's secret chambers are but partially opened, her vaults of gold and silver scarcely touched, her copper mines shining in but one great locality, her diamond fields few and far between, Africa but simply heard of, her oil wells merely in their beginning—all sufficient for our present population, but all too small for the coming myriads.

Nor does the Creator design us for mere parts of machinery, to manufacture His raw materials into the mechanism of civilization. He intends the education not of the hands alone, but of the head and the heart; to establish His great kingdom on the earth, not only in the University and in the College, but in the humblest school-house, and in all the workshops and homes of the world. Let all of us, individually and collectively, strive to study the elements and their combinations, and learn by obeying their laws to control them as readily as one man with a simple lever controls the ponderous train; but let us do all to the glory of the Creator and Controller of the Universe, and use our knowledge only in His service.

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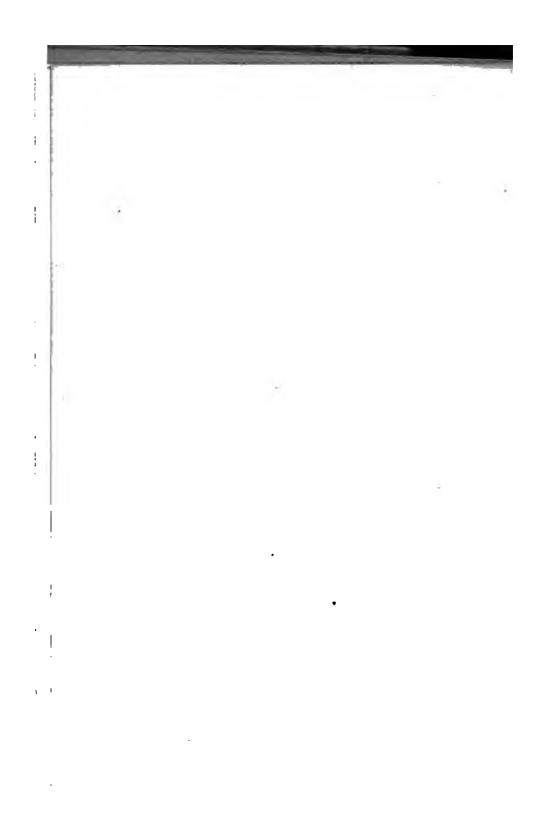
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AT THE

DEDICATION OF PARDEE HALL,

LAFAYETTE COLLEGE,

OCTOBER 21, 1873,

BY

ROSSITER W. RAYMOND, Ph. D.,

LECTURER UPON MINING ENGINEERING IN LAFAYETTE COLLEGE, PRESIDENT OF THE AMERICAN INSTITUTE OF MINING ENGINEERS AND UNITED STATES COMMISSIONER OF MINING STATISTICS.

WITH AN APPENDIX

CONTAINING A REPORT OF OTHER ADDRESSES AND THE GENERAL PROCEEDINGS OF THE DAY.

PRINTED BY ORDER OF THE BOARD.

EASTON, PA.

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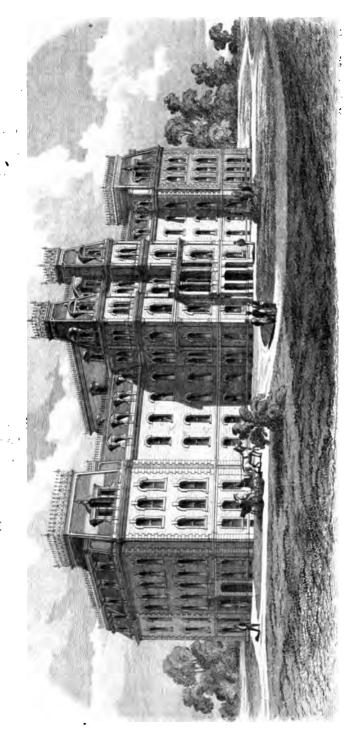
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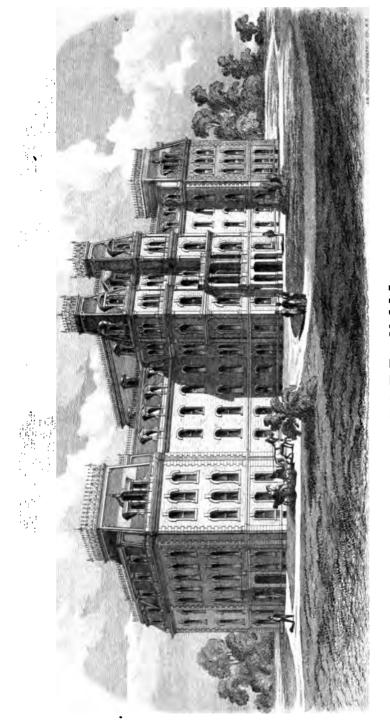
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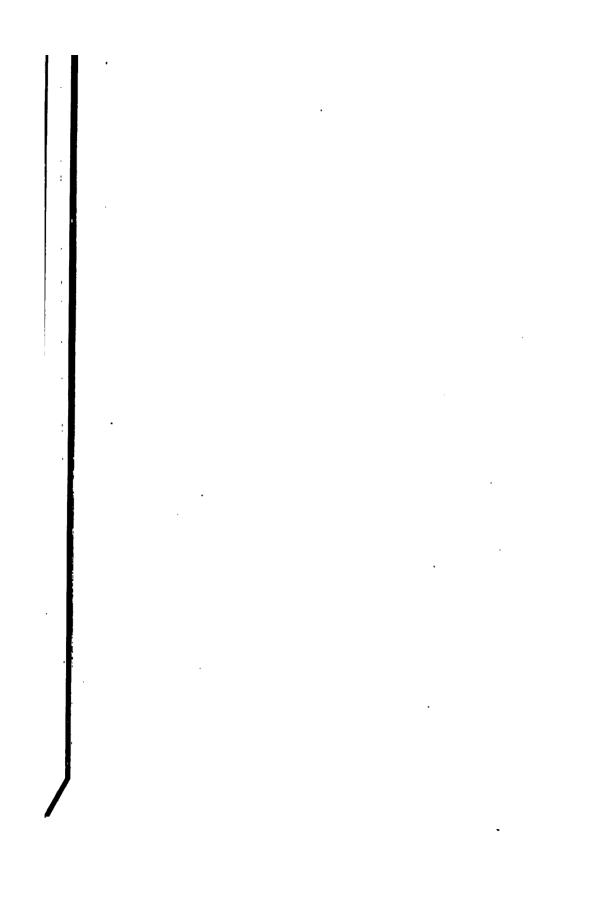
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ADDRESS

OF

R. W. RAYMOND, Ph. D.,

LECTURER ON MINING ENGINEERING IN LAFAYETTE COLLEGE,
PRESIDENT OF THE AMERICAN INSTITUTE OF MINING
ENGINEERS AND UNITED STATES COMMISSIONER OF MINING STATISTICS.

Mr. President, Brethren of the Faculty of Lafayette College. Ladies and Gentlemen: The precise position of the orator on this occasion is not perfectly clear. We are gathered in this edifice, beautiful with all the adornments of art and with the higher beauty of adaptation to the ends for which it is constructed—a palace, the possession of which might make any man proud and which will presently be transferred, we all being witnesses, to the formal charge of those intrusted with its administration in the interest of the great cause that inspired its erection. Until that transfer shall have been made, I suppose we are in some sense the guests of Mr. Ario Pardee, and perhaps it is a part of my duty to speak for him in bidding you welcome on this occasion. But this were unnecessary. The jubilant city below you, these open doors before you, the cordial faces around you, and, most of all, the presence of the generous host himself, have long since bid you heartily welcome. Between him and you no mere interpreter is called to stand. How can words speak for him whose deeds are the best eloquence of this hour? Nor is it necessary that I should speak for you, yet I cannot but attempt a feeble expression of the sentiment which I know is uppermost in all your minds. When a multitude is filled with one common feeling, the single voice that utters but an echo of it is not unworthy to be heard

And when that feeling is the spontaneous admiration of a generous act, the listener may discern in the tones of the humblest speaker, not vox et preterca nihil, but vox populi and vox Dei. the applause of mankind and the approbation of Heaven. Servile flattery would be out of place at this time, but to be silent for fear of offending the modesty of Mr. Pardee would be to surrender the right and betray the duty of praising "a good deed in a naughty world." The unselfish liberality of his endowments of education here deserves our hearty recognition. Yet I more admire their wisdom. None but the unselfish can be really wise in benefaction. It would have been easy, with the money that has been concentrated here, to win the reputation of munificence throughout the land. Innumerable subscription lists might have been enriched, countless paragraphs in the newspapers might have sounded the name of the professional philanthropist, whose purse was never closed. I would not disparage any form of generosity, but I do not hesitate to say that the highest use to which wealth can be put is not found in indolent yielding to the calls of charity. The steward of worldly property is bound to administer it with forethought and wisdom, to study earnestly the objects to be gained, and to seek the best means in his charity as in his business. On behalf of the Christian citizens of the United States—a nation whose national virtue, and vice, is giving-I wish to thank Mr. Pardee for a new example of giving wisely—giving thought as well as money. As the poet says, "he gives himself with his gift."

Americans are sometimes accused by foreign critics of an excessive love of making money. There is truth in the statement, but not in the blame conveyed. In the first place our people work harder, because their wants are more numerous than those of other nations. They read more books, they buy more pianos, they travel more, they try more earnestly (if not always with the best success) to satisfy the sense of beauty in the household, and all these things cost money. But when the limit has been reached at which all desired facilities and comforts of life can be secured, our people still continue to work and to make money. Yet they do not accumulate like misers; they rejoice in activity, they do not gloat over gold. It is not avarice, but the joy of conscious power that moves them.

Nothing, indeed, is sadder than the sight of such activity, pivoted wholly upon selfishness, outraging the feelings of the good or the rights of the weak. But nothing is more beautiful than the spectacle of wealth wielded with the strong hand and generous heart, of skill and sagacity brought to bear upon the question, how to benefit society. Such wealth breeds no danger to the community, and ought never to rouse the faintest sigh of envy. Every poor man in Pennsylvania has reason to be glad and give thanks to-day that Ario Pardee is rich.

I said that I would not speak for him, but in that which I am now about to say I am sure he would wish to join. Our tribute to Mr. Pardee himself would be incomplete if it did not make mention of one whom he has so highly esteemed and trusted and whom we all admire and love—the man to whom Lafayette College owes it to-day that she is able and worthy to accept this new and magnificent trust-I mean her honored president. Those who remember the condition of the college less than a decade ago and who look upon its condition and prospects now are able to measure, perhaps, the wonderful work that he has done; but who can measure the energy, the tact, the singleminded devotion, that went to the doing of it? The successive endowments, amounting now to nearly a million dollars, which have poured in during that period, have been so many testimonies of faith in the man at the helm of the enterprise. But all these tokens of outward success would be vain without the witness of the interior prosperity of the college itself; its harmonious activity; its high standard of scholarship; its steady and conservative progress; its cordial recognition of the demands of the age, and its firm retention of that which was best in the ancient curriculum and discipline. I believe that I speak the unanimous feeling of the faculty of the scientific department when I say that we regard President Cattell as a wise and prudent director, a sympathetic and judicious critic, a dear friend and the centre and power of our department, as of every other in the college.

As I look upon this scene, so significant of the new era in human thought and labor upon which we are entering, my mind turns to another scene gazed upon not long ago and never to be forgotten. Perhaps the subject which has filled the minds of the largest number of civilized men, for the longest time, during the year which is now drawing to a close is the Exposition at Vienna. Nothing could well be more unjustifiable than the statement that has been made in certain quarters that this Exposition was a failure. There are but two circumstances which could serve, even indirectly, as a basis for such an opinion. The first is the circumstance that the management of this Exposition on the part of the commission representing the Austrian government has incurred for that government the loss of many millions by the magnificence and costliness of its appointments. It is said that, apart from the original outlay involved, the daily expenses of the Exposition have been greater than its current receipts. But this, however it may be regarded from the standpoint of the party called upon to pay the bills, is certainly no case for complaint from the lips of those who, as visitors, have enjoyed for so much less than their due proportion of its cost the benefits of this extraordinary display. The second ground for the allegation of failure is the defectiveness of the system of arrangements, or rather the failure to adhere to any system in arrangement presented by the Exposition. This defect rendered it extremely difficult, if not totally impossible, to study satisfactorily either the products of any one nation as such or the natural exhibition of any one product as such. But this lamentable blemish was intimately connected with the extent and magnificence of the Exposition as a whole; with its extent, because it was the overwhelming abundance of objects exhibited which overflowed the limits assigned in the original plan to nations and to groups; with its magnificence, because the presence in great numbers of individual installations for private and separate exhibitions, though one of the most troublesome elements in the way of the serious student in any special department, nevertheless, to the eye of the casual visitor, added greatly to the beauty and splendor of the scene.

The truth of criticisms on these points being granted, there remains little to be urged against the statement that the Vienna Exposition far surpassed its predecessors as an epitome of the present condition of the world, with respect not only to the mechanic arts, but in the whole range of elements which go to make up modern civilization. More than any previous enter-

prises of its kind, it was a World's Exposition. This cosmopolitan character was due partly to the position of Vienna itself, situated as it is almost on the edge of Asia, partly to the extraordinary and not yet fully comprehended awakening of the Orient peoples within the last decade to the new life of modern progress. Both significant and amazing were the evidences of intellectual and industrial activity presented at this Exposition from regions which have for centuries scarcely contributed anything to the common stock of mankind in any department of science or art. The enormous material progress of the Austrian empire was so magnificently illustrated in the endless spaces devoted to that country within the walls of the Exposition, that we may fairly believe that Austria, in the effect produced upon other nations and upon the consciousness of her own citizens, will gain from this undertaking a benefit more than sufficient to counterbalance her financial loss. The remarkable exhibitions of Turkish, Persian, Indian, Chinese, Japanese and Egyptian industries, and the still more remarkable fact that all these remote regions should be roused to participate actively in such an exposition at all, opened a vista of the coming brotherhood and consolidated progress of the nations which never before in such glory and completeness had dawned upon the world. The Exposition was, in truth, a microcosm of the civilized world. To walk through its interminable aisles, its seven immense principal buildings, crowded with the achievements of human intelligence and perseverance in every clime, to visit the 200 outside buildings, palaces, peasant-houses, cafés, bazars, pavilions, historical exhibitions, scattered through the grounds, was like compressing into a few days the experiences of a lifetime of travel over the whole earth.

One of the most profound lessons taught by this Exposition is the great truth that human knowledge has grown far too wide and multiform to be compassed any longer by individuals, and particularly that the conventional culture of former generations fails to give even a key for the comprehension of this. In the face of this bewildering display of multiplied arts, the inadequacy of what used to be considered a liberal education was painfully apparent. One who wore the scholastic title of "Master of Arts" could not but blush to find himself in their presence,

and not only not their master, but almost absolutely ignorant of them all.

A second lesson, not less important and timely, is the conviction produced by such an ocular demonstration that entire ignorance of the world in which we live, and of the activity which characterizes the present age, will no longer be tolerable to cultivated men. While the scholar, confining himself to the narrow range of conventional studies, could live his quiet life untroubled by the thought of the vast realms and interests with which he had no concern, it was possible for men to maintain an artificial standard of learning and accomplishments. The time is not far past when a little familiarity with classic literature, pure mathematics, speculative philosophy, and rhetoric would entitle him to be considered an educated man, who was ignorant of living languages, of the geography and politics of foreign countries, of the physical sciences, and of the gigantic enterprises of human progress which are based upon them. But that time is already gone by; it is no longer wise or Christian, and soon it will be no longer fashionable to wrap one's self in the narrow garments of an outworn scholastic culture, and to ignore the vital problems and movements of the times. This brings us to the question of the new era in education corresponding to the new era in human liberty and human thought; the era of universal interchange and universal progress among the nations; the era of the application of scientific discovery to the welfare of humanity: the era of the triumph of mind over matter.

What then is education? No doubt in the widest sense it is the development and training of the faculties of man which, beginning at the cradle, ends only at the grave, and comprises not merely all that parents and teachers can impart, but the far greater influence of every circumstance of life.

It is, indeed, fortunate that such is the case. Sad would be the fate of many a man if the mistaken and incomplete preparation which he received in school were all that he had to rely upon in the struggles and labors of life. In many, if not in most cases, the training of the school does little more than to awaken and to direct, perchance to misdirect, those faculties which must afterward become sharpened and hardened by the attrition of contact with practical affairs. Nevertheless, the importance of

wisely administering that part of the education of a man which we call education in a narrow sense, cannot be over-estimated; and it is well to inquire what are its true objects and methods; whether it does or does not need to be modified to suit the changing conditions, social and political, of the human race.

It is not my intention to enter upon a thorough discussion of this profound subject. I can claim no such authority as would entitle me to attention, if I were rash enough to undertake this task. But one or two general observations, intended rather to formulate that which all parties believe than to advance propositions likely to arouse controversy, may not be out of place at this time.

What is practically the object of education in its limited sense? What is our object in sending our boys to school? I think we may all unite in one reply. It is to do what lies in our power to insure their success in life. I say we may all unite in this reply, since the terms employed are so vague as to permit each one of us to put upon them his own construction. Our ideal of success in life may range from the mere acquisition of money or fame to the highest conception of usefulness and benefaction. The means need not greatly differ, whether the motives be selfish or generous and lofty. So far as the physical and intellectual training of the student is concerned, those means which would make him strongest for his own aggrandizement would make him strongest also for the good of his neighbor and the world. Power is power; knowledge and skill are power, whether they are employed by noble or by mean and selfish motives.

The great antithesis of the age, illustrated not only by the Vienna Exposition of which I have spoken, but by all the social phenomena that surrounds us, consists in a tendency on the one hand to organization and combination, and on the other hand to the development and protection of individual rights and character. Great corporations and great nations are moving through contemporaneous history with a momentum never realized before in any age, yet at the same time there never was an age when the individual man more highly prized and more successfully defended, or more universally developed and applied, his individual rights and faculties. The dream of some philosophers, of a social organization in which the division of labor should be

carried to an extreme, and every man should do only that which he could do best, so that communities of men should become the units of the race of the future, contradicted not only the wisdom of the past, but the unconquerable instincts and unerring prophecies of the present. Side by side with the principle of the unity of the race in its interests, its progress, and its destiny —that principle which is the central social force of Christianity stands another, without which the first would be worthless and barren, that of the dignity, liberty, and responsibility of the individual man; and however much these principles in their social and political outworkings may seem to contradict one another, the practical experience of the race has shown that they cannot be separated, that man cannot reach his full individual development without the recognition of the brotherhood of all, and, on the other hand, that there can be no true progress of mankind except by the elevation and education of individual men. As, according to the poet, it is the citizens that constitute the state, so we may now say in a larger view it is the full-grown, free, intelligent, and virtuous man that constitutes the life, power, and hope of the race.

In the quaint and stately old cathedral of Antwerp, behind the high altar, is a picture before which I stood, not many days ago. with a special interest—an Ascension of the Virgin, by Quentin Matseys, the Blacksmith. You remember his romantic story, how he became an artist for love of a painter's daughter, and how, after years of laborious endeavor, he returned to his native town to conquer, by his triumphant art, both fame and happiness. The genius cannot have been wanting in him from the beginning, but it might have slumbered always had it not been called to life by the clarion voices of love and necessity.

In the transept of the same cathedral hangs the masterpiece of the prolific, exuberant pencil of Rubens—the Descent from the Cross. This great artist followed his own irresistible impulse; he flooded the world with pictures, laid all history and mythology under contribution to his easel, rose while yet living to a lofty eminence in the opinion of men, of which he cannot be said to be deprived by death and time. In comparison with the masterly completeness in spirit, design, and detail, in drawing and color, in light and shade, of his immortal picture, the

canvas of the blacksmith presents but a vision of meritorious mediocrity; and, gazing upon the two, one is compelled to admit that painters are born, not made.

That which is true of painters may be maintained as well of every handicraft and occupation. If the acquirement of the highest excellence in special directions is the object sought, then, one might say, nothing can be better as a means than encouragement and training of special tendencies. Let him pursue a given study who finds it pleasant and easy; let him who does not find it so, avoid it. "Follow your bent" may be, on this supposition, the best advice to every young beginner; education may consist mainly in the development of the strong faculties and the neglect of the weaker; society may be, in its normal state, an aggregation of specialists, presenting in its extremest form the principle of the division of labor as the best life of the human race.

But this is not the case. Even the object sought, of special excellence in separate lines, cannot be best attained by such a system. The processes and products and rewards of each pursuit are so bound up with those of all the world that the isolated worker stands in great risk of failure.

Nor is the production of specialists the chief end of education. These are the very characters we do not need to educate. They will produce themselves, when the inner impulse is strong enough to make them fruitful and useful.

What is, then, the end of educational systems? Primarily to draw out (as the word implies), to develop, to stimulate, and train the dormant faculties; to produce many-sided—as nearly as possible full-orbed and rounded men. Life and labor will soon enough beat them into special forms. There is no danger that our little schooling, of a few hours per week for a few years, will roll all minds to profitless uniformity. The peril is on the other side altogether; and it is for us to labor to prevent, particularly under the circumstances of American society, the rise of a generation of narrow specialists.

There is danger that in our new-born zeal for scientific education we may sacrifice the interests of a truly liberal culture, producing, as I have said, a generation of specialists, incapable of appreciating the departments of human thought which lie out-

side their own, or even of rising within their own departments to broad and comprehensive views. We must not use the microscope till we spoil the eyes. We must not overstrain the investigator until he becomes less than a full man. The chemists, geologists, engineers, must not cease to be intelligent and active citizens. It may be demonstrated that such a mistaken neglect of studies outside the range of a chosen profession, cripples activity and impairs success even in that profession. It is one result of the brotherhood of knowledge that no man, whether employed in the original investigation of nature or in the application of natural laws to practical ends, can advance successfully without perpetual communication of his thoughts to others, and the reception of their suggestions and experiences in return. Hence the mastery of language, which was the first condition of civilization, remains the essential condition of progress. The power to comprehend statements, logical arguments and demonstrations, and to make such statements as may be comprehended by others, and will carry weight and influence in the very perfection of their form, is a vitally important part of the preparation of every young man for his life's career. His success, aside from its moral qualities, will be in direct proportion to his influence over other men; and this influence, again, will be in part proportional to his command of the means by which the minds of men are moved—namely, language. Under this term we may include a knowledge of the methods of practical reasoning, and if this knowledge is best obtained by scholastic study of logic. then logic must be studied. If Latin and Greek are necessary, then they must be studied. For us, one thing is certainly necessary—a thorough mastery of the English tongue; and this alone has been made to yield, in Lafayette College, a mental discipline not inferior to that of the classics.

But influence is not due to language alone. Behind this vehicle of thought there must be fullness and variety of thought itself. Those fruitful analogies, felicitous illustrations, graceful associations, which come, and come alone, though wide acquaintance with human life and literature are so many elements of power; and without this broad basis of a common ground from which to move the minds of others, the student of a special sci-

ence, though possessed of the lever of Archimedes that would move the world, has no place whereon to stand.

In accordance with these principles, the object of the system of college education in America has always been—development and discipline of character and the broad preparation of the student for his subsequent special or professional pursuits. Our colleges may not have succeeded in realizing this ideal, nevertheless this has been their ideal; and it is the right one, as much to-day as ever. Whatever changes are required in our institutions of learning, to adapt them to the necessities of the modern era, must be changes in accordance with this principle—changes of means, not of ends, so far as colleges are concerned.

That changes are required is admitted on all hands. It is admitted that the physical sciences should be introduced to primary and preparatory schools; that they should be taught for the double purpose of mental discipline and of mental acquirement in the class-rooms of our colleges; that in teaching them the scientific, inductive, experimental, instead of the dogmatic, method should be pursued; and, finally, that either connected with our colleges or standing outside of them, schools of thorough scientific and technical special training are imperatively required. It is to inaugurate the wider activity* of such a school that we are met here to-day, and I shall say a few words concerning the relation of this school to Lafayette College on the one hand, and to technical education and the needs of the present time in technical departments on the other hand.

It must be considered a benefit, both to the college and to the school, that they belong together. So important an element as that which is represented by the scientific department must have

Mr. Pardee has also furnished the entire scientific equipment of the building at an additional cost of more than fifty thousand dollars.

^{*}The scientific school of Lasayette College "was organized in 1866, to carry into effect the conditions of a donation from A. Pardee, Esq., of Hazleton, Pennsylvania, In July, 1867, in response to the growing wants of the department, the original donation was increased to \$200,000, on condition that other friends of the College should add the same sum to its general endowment. The donations for that purpose, completing nearly half a million of dollars lately added to the College sunds, were made before January 1, 1869. In 1871 Mr. Pardee made another donation of \$200,000, for the erection of a building designed for the Departments of Engineering, Metallurgy, and Chemistry."—From the College Catalogue of 1872-3.

a beneficial effect on the atmosphere and the curriculum of the college, while, in turn, the learning and the culture of the col lege will shed its benefits upon the special course of the school. It is, indeed, eminently desirable, so far as it is practicable, that the young student should pursue a special course in addition to, and not instead of, a general course. And here let me allude to one of the greatest difficulties in the way of the American education—I mean the haste manifested by parents and guardians to get through with the education of those whom they have in charge. We are often told how absurd it is to attempt in this age of multiplied knowledge to educate young men with the means which were considered adequate half a century ago; but we are not so often told of the absurdity of attempting to prepare young men for active and successful careers in the time that was considered adequate fifty years ago. The enormously increased demands of modern life, requiring as they do that a man shall know more things, and know how to do more things, than were formerly sufficient for his reasonable success, are not to be satisfied by a mere change in a few subjects of instruction. It is not enough to substitute one study for another. The period of study must also be prolonged. In recognition of this principle, while it is for the present impracticable to make it an invariable part of a college education, by imperatively increasing the length of the college course, or by raising the standard of admission to colleges, the device of a post-graduate course has been very generally adopted; and it will not be long before experience will demonstrate that those men who have received the most thorough preparatory training are able to overtake and to outstrip in the subsequent race of life those who started with half-developed powers and half furnished minds.

On the other hand, it is the business and duty of the educator not only to furnish systematic preparation to those who have the ability to control their own plans or to wisely commence at the beginning and continue to the end, but also to assist those less fortunate ones who, forced prematurely to assume the responsibility of self-support, are nevertheless desirous of obtaining such benefit as they can from books and teachers. If it is true that a little knowledge is a dangerous thing, it is also true that half a loaf is better than no bread. A partial education is

better than none; yet this choice should never be made save under the pressure of necessity. The scientific department of Lafayette College will not refuse its benefits to those who desire to follow a special course, while at the same time it will be administered with full recognition of the greater value of a complete symmetrical system of college training.

While we trust that in time to come scientific investigation will be promoted in no mean degree by this school and its graduates, it must be confessed that at the present time its object is chiefly the preparation of young men for practical pursuits involving the applications of science. Nor can it be fairly said that this department is inferior in dignity to the pursuit of abstract science, so called. It is out of the ranks of the practical workers that those peculiarly gifted in scientific investigation are likely to arise; and it is in the ranks of practical workers that they must look, chiefly, for appreciation and support. It is no derogation from the value of a discovery of truth, to say that it can be made useful to man; and, hence, there is no inferiority in the position of those who make it useful to man.

Indeed, that which the whole world chiefly needs to-day, and our country not less than any other, is the application of scientific truths and principles already known to the affairs and labors and problems of daily life. We might even afford to pause in our career of fresh discoveries, to consolidate the progress and utilize the results already obtained. But the alternative is not presented; it is not necessary or best that any part of the intellectual activity of the age should pause; the advance of science itself assists, and is assisted by, the applications of science. For the sake of science, because for the sake of man, we need a scientific in the place of a barbarous or scholastic architecture; a scientific in the place of a traditional agriculture; a scientific in the place of an empirical engineering. We need more machinery, more economical applications of power, more effective processes of metallurgy and manufacture, more exact knowledge in all these particulars of our own condition and necessities, and of the degree in which these can be supplied by experience already attained abroad.

Lesoinne, a distinguished French writer, defines metallurgy as "the art of making money in the treatment of metals." This

definition may be applied to almost all occupations of life. The practical art of each is not only to achieve certain results, but to do so profitably, to make money in doing so; that is to say, to increase the value of the raw materials, whether wood, or cotton, or ores, or time, or ideas, by the use we make of them, and the transformation to which we submit them, so as thereby to really elevate the condition of humanity—to leave the world better than we found it. This is, in its last analysis, the meaning of honestly making money. Men are put into this world with limited powers and with limited time to provide for their own sustenance and comfort, and to improve their condition. A certain portion of these powers and this time is required for the support of life in a greater or less degree of comfort, and with more or less multiplied means and avenues of enjoyment, activity, and influence. Whatever their labor produces more than this, is represented by wealth, and for purposes of exchange by money. To make money honestly, is to do something for other men better or cheaper than they can do it for themselves; to save time and labor for them—in a word, to elevate their condition. It is in this sense, greatly as we Americans are supposed to be devoted to making money, that we need to learn how to make more money; how to make our labor more fruitful; how to assail more successfully with our few hands the natural obstacles and the natural resources of a mighty continent; how to build up on the area of that continent a prosperous nation united in varied, fruitful, and harmonious industries, glowing with patriotism and inspired by religion.

In this work we need specially the basis of a more thorough technical institution, applying principles of science to the material and economical problems involved. This education is necessary to supply the directing forces for the great agricultural, manufacturing, and engineering improvements of the country. It is also needed as a solvent and remedy for the antagonism between labor and capital. The true protection of labor will be found in its higher education, and in opening to the individual laborer for himself and for his children, by means of that education, a prospect of indefinite improvement and advancement.

But we do not flatter ourselves that the operation of a school will be sufficient, by any magic that there is in books or

teachers, to produce full-grown, well-trained, wise and ready experts. Going to school is but opening the door; leaving the school is but crossing the threshold. What we wish is to open the door right, to open the right door, and to start the beginner in the right direction. It would be easy to show two great correlative propositions to be true; first that scientific instruction is not and cannot be a substitute for necessary practice; secondly that practice alone cannot be a perfect substitute for theoretic knowledge—for that acquaintance with principles involved in any occupation, with their mutual relations, their comparative importance, which enables the workman under new sets of circumstances to perpetually reconstruct his art out of his science.

We have instances enough of learned students of finance who could not be trusted to manage a bank, and, on the other hand, the recent history of our country sufficiently demonstrates that many experienced bankers are too ignorant of the principles of finance to foresee approaching danger, to remedy present troubles, or even to know what is desirable for the future, let alone what would be the proper means of reaching such desirable results. Political economists are not necessarily practical statesmen, yet it is ardently to be desired that practical statesmen were more frequently political economists.

In the realm of metallurgical and engineering operations the difference between theoretical and practical training is, perhaps. still more striking. The student of chemistry in the laboratory cannot be made acquainted with many of the conditions which obtain in chemical and metallurgical operations upon a larger scale. All the chemists of the world failed to comprehend or to describe correctly the apparently simple reactions involved in the manufacture of pig iron, until by the genius and enterprise of such men as Bell, Sunner and Akerman, the blast-furnace itself, in the conditions of actual practice, was penetrated and minutely studied. Moreover, in all the experimental inquiries of the laboratory the question of economy plays no part. It is the art of separating and combining substances which the student follows there, not the art of making money. That education of judgment and decision, of choice of means for ends. which the exigences of daily practice give, cannot be imparted in the school.

In mechanical engineering the same principle is illustrated. The highest department in this art is that of construction, and in this department the highest function is the designing of machinery. No v the most perfect knowledge of the theory of a machine and its mathematical relations, of the strength of materials or the economical use of power, will not suffice to qualify a man to design a machine or a system of machines, for the reason that in this work an element must be considered not at all included in theoretical knowledge—namely, the element of economy in the manufacture as well as in the operation of the machine. A machine, any part of which requires for its manufacture a tool (such, for instance, as a peculiar lathe) which is not already possessed by the manufacturer, and which, after the construction of this one part, would not be necessary or useful for other work, such a machine could not be profitably built. In other words, machines must be so designed, in a large majority of cases, as not to necessitate the construction of other machines to make them, and the planning of machinery so that it shall be at once economical and durable in operation and simple and cheap in construction is not merely an important incidental duty, it is absolutely the chief and most difficult duty of the mechanical engineer.

But if you consult, as I have done repeatedly, the men who, by long and laborious practice, have arrived at great skill and experience in any one of these professions, in spite of deficiencies in early training, you will find that they heartily lament the lack of those opportunities which the careless student is so apt to undervalue; that they spend many weary hours in the attempt to make good this lack, and that they find themselves restricted and cut short in their success for want of that mastery of general principles and of theories which would enable them to rise higher and assume wider command. It is in school that we teach the student how to study, how to investigate, how to take hold of the problems of practice as they rise. We do not solve all these problems in advance for him. It is here that we impart scientific method and the knowledge of scientific means and manipulations. Yonder in the great world of actual life every man must show for himself what stuff is in him, and wearing the armor and wielding the weapons with which he has

been furnished, he must conquer or fall according to his fortunes and his deserts.

The importance of the different branches of engineering to this country scarcely needs an argument. Skilled labor and skill in the direction of labor are still urgently called for on Take for instance our mining industry. If we every side. begin with the most important of all substances obtained by mining-namely, coal and iron-what a spectacle of intense energy and rapid development is presented by the present condition of the country! The immense area of our coal fields, from the small anthracite deposits of Rhode Island to the vast formations of lignite, that stretch from the British line along the whole flank of the Rocky Mountains far into Texas, and, still further west, the deposits of the Pacific coast, from Alaska to California, an aggregate area of more than 300,000 square miles, resound in every part with the activity of the miner; and our product of iron ore, augmented every year by a stupendous increase, is still inadequate to supply the eager demand of the furnace men and their facilities for the manufacture and the insatiable market that calls for all and more than all that we are so far able to produce. Of other metals we have no lack. The copper of Lake Superior, Tennessee, Virginia, North Carolina, has been already the source of considerable production, and these regions are far from exhausted, while in the great states and territories of the West this metal is certain to play in the future an important part, becoming in Arizona and Montana at least, as it is already to some extent in Colorado, the basis for the smelting and reduction of materials containing gold and silver. Zinc is produced abundantly in many parts of the country, and its manufacture will doubtless increase with the growth of the market. Nickel is substantially a monopoly. since the single mine in this State represents the product of the whole country. Tin is found in various places, though never thus far in large quantities or under such favorable circumstances as to permit its profitable working. With regard to lead, it may be remarked that its production in this country has recently received a fresh impetus from the discovery and development of the great deposits of argentiferous ores in the far West, so that it may be expected that the loss occasioned by the decline

of lead mining in the Mississippi Valley is more than made up from these fresh sources. To these items already enumerated I must add the great production of petroleum and salt in the East and of the precious metals in the Rocky Mountains, the Inland Basin and along the Pacific coast.

Now in the utilization of all these natural resources we are approaching every day a condition of affairs imperatively requiring the assistance of science. Our coal mines, having attained greater depths, show themselves not less dangerous from fiery or noxious gases than those of the Old World. Few problems are more difficult than those which the mining engineer encounters in fighting fire underground, and even our anthracite mines, it now begins to appear, will by no means be hereafter as free from this evil as they were in earlier years. In all other kinds of mining, moreover, the difficulty, if not the danger, is increased as operations are extended under ground. A point is reached in such an undertaking where the lack of skill and forethought in opening the mine makes itself felt in the greatly increased cost of working it; and this evil, growing continually greater, can only be remedied, if at all, by a reform in administration, while it can be prevented by the employment of proper skill at the outset. Moreover, as the mechanical difficulties of mining are increased, the necessity of machinery for drainage, ventilation and transportation becomes evident. There is, therefore, a natural demand for persons capable to plan, erect and operate such machinery. Again, the extension of underground workings necessitates careful instrumental surveys. It is no longer possible to estimate by the eye the dimensions and positions of subterranean works. Complete and accurate maps are required to enable the miner to conduct his explorations and exploitations with judgment and economy, and to furnish him a trustworthy knowledge of the condition and resources of his mine. Then, too, as operations advance, the character of the product changes. The early stages of mining in any district and in any country are usually attended with considerable recklessness and waste, the losses of which are made good by the richness of the materials mined. The most promising deposits are first attacked, of these the richest portions are exclusively In short, the cream is skimmed from the mineral

wealth of the country, and it is not until this period has measurably passed away, and the lesson has been learned that a permanent industry must be based upon the utilization of that which has been considered worthless hitherto, that the era of scientific work commences. This entails the necessity of contrivances to reduce expenses in the extraction of ores; of economical methods for concentrating their bulk and thus increasing their relative value, and finally, of new processes for the complete reduction of those more complicated combinations which in the flush times of the young industry were not treated at all.

Thus, for example, in our coal mines we are studying how to diminish the waste of coal caused by a hasty and rude extraction, and to contrive such methods of mining as will not destroy those narrower and poorer seams which, for the present, are not worked, and we are attempting to make useful in one way or another vast amounts of the inevitable refuse which attends the extraction, breaking, sizing and shipment of coal.

A similar problem meets us in iron mining. The sudden expansion of our iron industry, calling for more extensive supplies of crude material, has had the immediate and natural result of a depreciation of the quality of ore furnished by the mines. Even from regions of such exceptional wealth in this respect as Lake Superior, it has been found impracticable to ship ores in the required quantity and to maintain the quality, at the same time, which formerly characterized them. Hence the ironmasters throughout the country are busy with experiments for the economical treatment of leaner or more impure ores than they formerly obtained. The great question of iron metallurgy to-day may be said to be the production of a good quality of iron from ores of a relatively inferior class.

The metallurgy of gold and silver presents a similar spectacle. It is no longer by finding nuggets or by washing rudely the auriferous earth collected in the eddies of mountain streams that the gold product of this country is obtained, but by the employment of natural forces on a grand scale, sluicing down mountains, and concentrating vast quantities of almost barren material, or by employing the affinities of other substances and extracting the precious metal by chemical combinations; and in the place

of the earlier and ruder methods of silver extraction we are adopting more perfect mechanical concentration, chemical decomposition, and the complicated reactions of the shaft, furnace, and reverberatory.

But it is not only in the production of the simple metals that this condition may be observed. In all the manufactures based upon the mineral products, the same tendency is manifest. Some one has well said that the utilization of refuse is the measure of civilization. That which the alchemists sought in vain, their descendants are finding step by step—the Philosopher's Stone, which will turn the most despised substances to gold. The illustrations of this are innumerable. I must be content with one or two.

Few forms of refuse were more troublesome to dispose of, a few years ago, than the coal-tar which accumulates in the manufacture of gas. At first, it was used only as a rude kind of paint for iron, etc. Afterward, it was distilled, and yielded a volatile oil, with which Bethel impregnated wood to preserve it from decay. Then it was found that one of the distillates was a good material for removing stains and spots from cloth. But all these applications were inadequate to dispose of the great quantities of tar that accumulated. Then came the grand discovery of aniline, enriching the world with new and brilliant colors; and now even the refuse of the aniline manufacture yields anthracene and alizarine, the artificial madder, the discovery of which is one of the most important events of the day, revolutionizing a great industry, and completely annihilating a branch of agriculture, to supply its place with a manufacture less expensive of labor, and hence in the end more beneficial to man. So now we have swarthy tars on the forecastle and radiant tars on the promenade deck. The black and ugly substance that was so long despised has taken wings of beauty and is admired of all men. It was an angel in disguise.

Another curious instance is the new manufacture of crayons from the gypsum which is left after making soda-water, and the calcareous slime constituting the refuse of the soap factory. What we call chalk and use on the blackboard is in most cases not chalk, but largely gypsum. But time would fail me to recount the numerous applications of science in the utilization of

waste material. It is, perhaps, the most promising field for making money in the present day; and after the explanations already given, you will understand that I mean to say it is a promising field for undertakings beneficial to society. And it calls loudly for workmen—not for professional inventors; that is, mere guessers and vague experimenters, but experts, who, knowing their ground, and divining truly what needs to be invented or improved, will advance with sure and safe steps.

I cannot pause to speak at length of the opportunities offered in mechanical, civil, and railway engineering and architecture. There is an army of men already employed in these professions; but it needs recruits, and the service is one in which merit finds room to rise.

In all these occupations of which I have been speaking, there is a demand for thorough, trained, practiced, skillful men. There is no royal road to success in them; but there is a sure road, that begins here, in faithful study and preparation. The moral element of this preparation is not less important than the intellectual. One of the leading engineers of the United States said to me the other day, "When I wish competent agents to superintend works for which I am responsible, my greatest difficulty is to get good men. I can find twenty who know enough for every one whom I can certainly trust." Uprightness, virtue, Christian manhood, these are sure to tell in the life-career. I cannot but deem it a peculiar advantage of Lafayette College as a place of preparation, that it is measurably removed from the excitement, distractions, and temptations of great cities; that the moral and religious influences of the place are like the skies that bend and the breezes that blow over it, pure and healthful.

Before I close, let me appeal to young men to throw away finally and for ever the notion of the superiority of the so-called learned professions in point of respectability over the calling of the mechanic or the engineer. George Fritz of Cambria, whom many of you knew, and whose recent loss you do not cease to mourn, lived as useful a life, and died as much honored and regretted by his fellow-citizens, as if he had been an orator or a statesman. What he accomplished by patient ingenuity for the art to which he devoted himself gave him as good a title to fame as that of the proviest savant. I do not say that those who feel

called by inward fitness or by outward intimations of Providence to become lawyers, physicians, or even philosophers, should not follow the call; but in the name of manhood, do not choose any one of these, still less the army, and least of all the pulpit, because you think it is "respectable!"

I must protest also against the strange delusion that carries so many young men into trade—the delusion that fortunes are more easily accumulated in this than in other lines of life. The statistics are against this assumption. By far the larger part of our merchants go into bankruptcy and have to begin anew, or change their occupation altogether. Thousands of young men are found in New York every winter almost starving for want of work, who cannot do anything but keep books or run a commission business, or sell ribbons over a counter. Trade is honorable, when honorably conducted; but it is just now overdone. We have too many middlemen between the producer and the consumer; and the young man who, without special fitness or reasonable prospects of promotion, blindly goes into mercantile life, is foolishly swelling the ranks of an overpopulated class.

But what shall I say, then, of the strange furore to go into Wall street "and operate"? The legitimate business of finance, exchange, banking, etc., is absolutely essential to industry. Far be it from me to undervalue it or its honest representatives. But the desire of getting rich suddenly by speculation—of getting money, not making money—that is, creating or producing value; of living by the wits, not the earnest labor of mind and handthis is a temptation of Satan. And here, too, the inexorable statistics show the folly of the gambler's hopes. Thousands of so-called "country customers" go into Wall street every year with small capital which they mean to multiply. Six months is longer than the average career of these adventurers. Their little fortunes pay the expenses of the keener speculators. And even of the few who, after years of debasing practice, at last become skillful operators, how many really carry after all as much money as their trouble, anxiety, and slavery of labor has been worth? Every year there is a new king of the street, who in many cases comes to the throne like an Oriental usurper, by treacherously killing his predecessor.

These are times, my friends, that preach loudly the instability

of riches. When panic shakes the market and the exchange, and values shrink, and great houses fall to pieces, carrying down all who trusted in them, the man who is serenest and most safe is he who carries a reserve of capital in his brain and hand, and who can say, "Come what may, while I have this knowledge and skill that men require, I shall not be utterly cast down."

For the sake of your success and your manhood, young man, lay broad the foundations of education: do not be afraid of learning too much, or of preparing thoroughly for your life's career. And, whatever that career is to be, remember that you cannot safely be ignorant of the great facts of science and its applications in human industry. This knowledge will be ranked henceforward among the necessary elements of a liberal education. And if you are drawn, as I think active and healthy minds cannot fail to be, to the practice of some useful art, we hold out our hands of welcome to you, and offer you an initiation into the mysteries which you must thereafter explore alone. You will be rewarded at every step, if you advance in the scientific and humane, not the drudging and greedy spirit; and you will find yourself in the line of deserved wealth and honor. To this useful application of scientific truth, to this true Art of Making Money, we dedicate this edifice, in itself a glorious illustration of the true Art of Using Money, trusting that the purposes and labors of the Department this day transferred to it may ever deserve the applause of man and the prospering favor of Almighty God.

APPENDIX.

The following report of the general proceedings of the day is taken from the Easton Daily Free Press of October 22:

The vicinity of the college yesterday morning presented a busy scene. Some preparations were yet to be completed about the new building. At an early hour visitors began to arrive, and strange faces were seen in every part of the grounds. The students felt the importance of the occasion, and determined that the day should not lack in being honored through any want of enthusiasm on their part. At ten o'clock the college bell was rung, and according to the arrangements, the different bodies who were to take part in the procession formed in the neighborhood of the chapel. The different classes, under the direction of their marshals, occupied the portion of the road immediately north of the chapel. They were gay in the colors of their respective classes and appropriate badges, and impatiently awaited the time when the procession should move. The Synod of Philadelphia, which had left Philadelphia early in the morning in a special train, arrived about ten o'clock, and in a body marched up College Hill. The trains on the New Jersey railroads also brought large numbers of the members of the Synod of New Jersey, who at once proceeded to the centre of attraction—the grounds of the college. Many distinguished men and scholars, representatives of other institutions, were present.

The procession was at last formed under the direction of Professor Youngman, the college marshal, and headed by a band of music, moved toward the new building. It was composed as follows:

The officers of the college classes as escort.

The orator of the day with the president of the faculty.

The governor of Pennsylvania with other officials.

The present and former trustees of the college with trustees of other colleges.

Present and former members of the faculty with representatives from sister institutions.

The clergy and other specially invited guests, including the American Institute of Mining Engineers.

Alumni in order of their graduation with former students of the college who did not take their degrees.

Citizens of Easton.

Undergraduates of the college.

A dense crowd had already gathered about Pardee Hall. The different floors were thronged with crowds of visitors, and the galleries which had been thrown open to the public at ten o'clock were already completely filled, the ladies occupying a majority of the seats. When the procession reached the building, it parted right and left up the staircases on either side of the corridor, and thus entered the spacious auditorium. It was not long before the large room was densely crowded. The bands of music were stationed in the music gallery, directly over the platform, and discoursed sweet strains at different stages of the proceedings. A large platform had been erected in the front, and on this were seated President Cattell, Ex-Governor Pollock, Mr. Pardee, Governor Hartranft, a number of the trustees of the college, and distinguished visitors from abroad. Among these were President Barnard, of Columbia College; Rev. Dr. McGill, of Princeton Theological Seminary; Selden T. Scranton, of Oxford, N. J.; President Coppée, of Lehigh University; Prof. T. Sterry Hunt, of the Massachusetts Institute of Technology; Prof. Meyer, of Stevens Institute, Hoboken; Prof. Johnson, of Yale; Prof. Hillman, of Dickinson; President Muhlenberg; George Musgrave, D. D., LL.D.; Rev. J. S. Woodside, from India; Rev. Dr. Miller, moderator of the Synod of New Jersey; Rev. Dr. W. O. Johnstone; President Magill, of Swarthmore.

The exercises began with an invocation by President Cattell, who afterward introduced to the audience the orator of the day, Professor Rossiter W. Raymond, a member of the college faculty, United States Commissioner of Mining Statistics, and president of the American Institute of Mining Engineers.

At the conclusion of Professor Raymond's eloquent address, which was listened to with great interest on the part of those present and interrupted by frequent bursts of applause, Professor Barlow, in whose charge the preparations for the collation had been placed, announced that the tables had been spread in the large laboratories on the fourth and fifth floors of the building. There was room for six hundred, and that number would be admitted to the rooms in the order of the procession, while the others would be served at successive tables.

The spacious laboratories had been turned into banqueting halls, and long lines of tables groaned beneath the substantial viands provided. Beautiful bouquets of flowers adorned the rooms.

The streets of Easton had presented a busy spectacle all the morning. The different trains brought hundreds of visitors, and a con-

stant stream of people flowed toward College Hill. Bands of music paraded the streets, stopping often before the Free Press office to tender the compliment of a serenade. In the afternoon business was entirely suspended. Every store was closed, the noise of the factory had ceased, quiet brooded over the workshop. The merchant had left his counter, the mechanic had doffed his apron, the lawyer had thrown aside his brief, and all united to honor the day. There has not been an occasion for years in which our citizens have joined with such universal interest.

Soon after one o'clock the different organizations, which were to take part in the parade of the afternoon, were moving through the streets of the town. All the civic societies were represented, and South Easton and Phillipsburg sent their organizations. Under the direction of the Chief Marshal, George M. Reeder, Esq., the line was formed on South Third street, the right resting on Centre Square. It moved in the following order:

Chief Marshal, George M. Reeder, with Assistant Marshals, Messrs.

Joseph S. Osterstock, J. N. Thatcher, John Bacon and Adam

Drinkhouse, mounted on gayly caparisoned steeds.

Platoon of police.

Easton Cornet Band.

Easton Grays, under command of Captain Frank Reeder.

Members of Fifty-first Pennsylvania Volunteers, under command of
Captain Daniel L. Nicholas.

Bell Post, G. A. R., under command of Samuel Lesher, S. V. C. Columbia Council, O. U. A. M., John M. Phillips, Marshal. Excelsior Council, Jr. O. U. A. M., Howard Bitters, Marshal. BATH CORNET BAND.

Fatherland Lodge, I. O. of O. F., Joseph Fladd, Marshal.

Peace and Plenty, Lehicton and Elon Lodges, I. O. of O. F., A.

Laubach, Marshal.

Washington Camp, P. O. S. of A., G. Heller, Marshal. Druids of Easton, H. Hoffmier, Marshal.

Knights of Pythias of Easton, J. Deichman, Marshal.

Teedyuscung Tribe, I. O. of R. M., of Phillipsburg, S. Vanorman,

Marshal.

Saranac Tribe, I. O. of R. M., of Easton, T. Coyle, Marshal. Emerald Society, M. J. Levan, Marshal. German Mechanics, John Newbrand, Marshal.

Governor John F. Hartranft, Auditor-General Harrison Allen and Chief Burgess A. B. Howell, in a carriage drawn by four horses.

NAZARETH BAND.

Town Councils of Easton, South Easton and Phillipsburg, School Board of Easton. Easton High School.

RINGGOLD BAND, of Reading.

Chief Engineer James Ward and assistants.

Humane Fire Company, No. 1, with carriage.

Washington Fire Company, No. 3, with steamer drawn by four horses. Keystone Fire Company, No. 5, with steamer drawn by four horses.

Lafayette Fire Company, No. 6, with carriage.
Citizens in carriages.

The procession was the finest and most imposing that has appeared in the streets of Easton for years. It was over a mile in length, and, gay with flags and banners, was a chief feature of the outward display of the day. The governor of Pennsylvania was greeted with cheers along the route of the parade. The pupils of the High School carried a banner especially gotten up for the occasion. The splendid flag of Excelsior Council attracted attention. The Fire Depart-

ment, with engines and carriages, presented, as usual, a fine

appearance.

The procession moved over a short route through the streets of Easton, as had been previously announced, and then marched over the Bushkill bridge and up the road to the college grounds. At different points on the hill crowds of people were gathered to witness the approach of the procession. From some favored points a view of the whole line of marching men, with flags and ensigns and regalia, could be obtained. After the head of the line had arrived upon College Hill the procession could still be seen moving down from the foot of Third street.

Over the gate leading into the college grounds, the Lafayette Fire Company had erected an arch trimmed with evergreens and flowers. It bore in large letters, the names

LAFAYETTE—PARDEE.

Upon the bases on which it rested were the words, JUNKIN, 1832. CATTELL, 1873.

Some verses of Scripture were inscribed on the keystone of the arch, the 17th, 18th and 19th of the sixth chapter of 1 Timothy.

All the afternoon crowds of people had been pouring up College Hill. They crowded Jenks' Hall, they filled the new building, and were scattered over the campus. The crowd around Pardee Hall was numbered by thousands. A procession had been formed at the College Chapel of the undergraduates, the Faculty and the Trustees of the college. At its head, side by side, walked President Cattell and Mr. Pardee. It moved toward the entrance of the college grounds, where it met the procession from town, and escorted it through the college grounds. The procession moved around Pardee Hall, and halted at the front of the building. President Cattell, Mr. Pardee and the distinguished guests advanced to the elevated plateau immediately in front of the entrance, while the procession from town passed in review. An immense assemblage had now gathered about the front of the building. The balconies and windows of the edifice were filled with ladies and gentlemen, as were also those of the adjoining college buildings.

As soon as quiet was restored, the simple ceremonies of delivering over the building into the possession of the college authorities began. Mr. Pardee, in a modest address, handed over the keys to President Cattell. He said:

The completion of this building makes it my very pleasant duty, on behalf of the Building Committee, and myself as the donor, to formally present it to you, as the representative of the Trustees and Faculty of Lafayette. The building itself speaks of the skill and taste of the architect, the faithfulness of the builder, and the care with which it has been supervised during its erection. Our responsibilities have not been small; but on you, sir, and on the students who shall go out, year by year, from these halls, rests a far larger responsibility—the reputation of the institution. But, looking to the future by the light of the past, we rest the responsibility on you with no misgiving. I have the honor, sir, of now presenting you with the keys of the hall.

After the tumultuous cheering that greeted Mr. Pardee had ceased, President Cattell responded as follows:

In receiving from you the keys of the building for the scientific department of the college which you have so munificently endowed, I can find no words adequate to express my own thanks, or the thanks of my colleagues in the faculty, for this grand addition to their means of attractive and thorough teaching and of their own scientific researches, or the thanks of the trustees and patrons and friends of the college, alike interested in her welfare, or the thanks of all friends of education who see in such a large and unselfish use of wealth for the benefit of mankind the noblest use to which it can be applied. And I know you, sir, so well, that I am sure the less I say to you on an occasion so public, the better you will be pleased. I shall, therefore, only assure you that our hearts are full of gratitude for your munifi-

cent gift and for your wise and judicious counsels under which the college has grown and prospered, and that we and our children will not cease to cherish and honor your memory, and that our heartfelt prayer to the Giver of every good and perfect gift is for His richest blessings to rest ever upon you and yours.

The whole assembly, with one voice, then united in singing the Doxology, "Praise God, from whom all blessings flow." When the last echo of the grand old hymn had died away upon the air, the venerable Dr. Coleman, professor of Latin in the college, invoked the blessing of God upon the institution and the man who had so munificently endowed it.

Ex-Governor Pollock then introduced Governor Hartranft, who was greeted with loud cheers. The governor thought that this was a proud day for Easton and the college. It was a proud day for him to be present and see the keys handed over by his liberal-hearted friend Mr. Pardee to the president of the college. He had not had the pleasure of close association with the college, but from what he had seen of President Cattell, his executive ability, his energy and his enterprise, he was satisfied that the magnificent gift of Mr. Pardee had fallen in good hands. He spoke at length of the necessity of a scientific education. He advised young men not to go forward too rapidly in life, and to select their professions with care. If there were more men in active life of the character of Mr. Pardee the world would be better. The donor of the hall had unconsciously erected a monument to himself which would endure throughout time.

The next speaker was Edward H. Green, Esq., president of the borough council of Easton, who was warmly greeted. He said he was not a public speaker, and if he were, he would not detain the vast assemblage at this time with any extended remarks. He would simply say that, on behalf of the citizens of Easton, he would congratulate the college on the princely gift they had received that day from Mr. Pardee

He was followed by Major A. B. Howell, chief burgess of Easton. He said that to him this was a double pleasure. He felt a profound interest in the occasion, both as a graduate of the institution and as a citizen of Easton. He rejoiced that the college had been founded in our midst, not simply on account of the material advantages, but for the educational, literary, and religious influences that flowed from her. The college held out before all men the maxim, "The fear of the Lord is the beginning of wisdom." We dedicate this building to-day. We hope that these halls may send forth men who, by their

living and dying, may prove that this trust was committed to a worthy charge. (Great applause.)

Mr. Edward F. Stewart, president of the Easton board of control, next appeared before the audience. He stood here as a representative of the college, being an early graduate. But he represented more directly the public school system. It had been said that there was a connection between the public school system and the college. He thought that this was so. It was thought that education was only fit for professional men. In a country like this it was especially essential that every man should at least have the elements of an education. A great republic could only be sustained by the intelligence of its people. The workman might not be better qualified to drive the plow or wield the hammer, but he would represent manhood. (Continued cheering.)

A short and stirring address followed from Ex-Governor Pollock, who said that he was never so inspired before to battle in the cause of education as he had been to-day.

The addresses in the open air were then brought to a close with the announcement that they would be resumed in the lecture hall of the building. The procession was then re-formed and took up the line of march for the town again. The auditorium was found to be already occupied, and but a tithe of the multitude could gain access. It was with difficulty that the speakers and specially invited guests could reach the platform.

Prof. J. P. Wickersham, LL.D., superintendent of public instruction in Pennsylvania, was the first speaker.

He came here to show the sympathy of the public school system of Pennsylvania with the good work that was being done in Lafavette College. The building that they dedicated to-day was a proud monument to its founder. It was a monument that would outlast the royal families of Egypt. They builded pyramids that would crumble to the dust, but this monument would reach to the skies, ay, even beyond the skies. Personally, too, he was proud that this building had been erected here. Fifteen years ago he had ascended the hill and viewed Lafayette College. To-day he felt that there had been a wondrous change, and all honor should be ascribed to the man who had been at the head of the institution for the last ten years. At Lafayette a reconciliation had been effected between colleges and the public school system of instruction. He formerly had to complain that the college men of Pennsylvania had stood aloof from common schools. But he found the president and professors of Lafayette mingling with the common school teachers and taking them by the

hand, visiting State associations, and taking part in teachers' institutes. It was one reason why the institution had recently experienced such wonderful prosperity.

Several speakers followed each other in short, enthusiastic addresses. and the exercises were kept up until the evening shadows darkened the room. Among the speakers were the Rev. Dr. John Harris Jones, president of Trevica College, South Wales, and Rev. Dr. Robert Knox, of Belfast, Ireland, delegates to the Evangelical Alliance recently held in New York. Dr. Knox referred to the fact that a former student of Lafavette, Rev. Robert Watts, D. D., was a distinguished professor of theology in an Ireland college. Hon. B. G. Northrup, secretary of the Connecticut Board of Education, expressed the conviction that such courses of technical study as were afforded at Lafayette, with all the apparatus and other appliances offered by the noble building in which they were met, would soon do away with the necessity of our young men going abroad for technical education. He also expressed his delight at the cordial and enthusiastic feeling exhibited by the citizens of Easton toward the college. It was a rare sight, the silent and deserted town beneath them, all business suspended, and the whole populace poured forth to greet the college on this glad day! Gownsmen and townsmen rejoiced together! Hon. Heister Clymer, of Reading, Pa., made a brief but eloquent address. Rev. Dr. Charles H. Robinson, of New York, spoke in his usual felicitous manner. Dr. N. J. Woeikof, secretary of the Meteorological Committee of the Imperial Geographical Society of Russia, who had come to the college to visit the lamented Dr. Coffin, gave his tribute to the extended learning and great usefulness of Lafayette's deceased professor of mathematics and astronomy.

In introducing Ashbel Welch, of New Jersey, the distinguished civil engineer, and member of the board of examiners for the Pardee scientific department (who made a short but excellent address), President Cattell gave a brief historical sketch. He said that one day, about forty years ago, a young lad was plowing in his father's fields in Rensselaer county, in New York, when he received a letter. He opened it, and found the offer of a position as rodman, down in New Jersey, with Mr. Welch. He left home to take it the very next day, bringing with him the fortunes of Lafayette! He (Ario Pardee) came to this valley about the time the college was started. The speaker told of the unostentatious way in which the first gift of \$20,000 was put in his hands in 1864, which was followed by still larger sums, from time to time, as successive additions were made to the Scientific Department, until the amount given by Mr. Pardee was

"I would there were many more such friends of Christian education. They touch not—like some noisy philanthropists—the mere surface of things, but the deep foundations. They build for many generations, and many generations shall rise up and call them blessed. I would go a weary journey to take the hand of Mr. Pardee, and tell him how men, afar as well as near, appreciate his well-considered munificence."

President White, of Cornell University:

". . As we are in the midst of our first term and under much pressure of university duties, it is exceedingly doubtful whether any of us can be present with you on that occasion. But we send none the less our hearty congratulations to you, and join in the thanks which will be earnestly expressed on that day to Mr. Pardee for his munificent gift, which is a benefit not merely to your institution, but to the whole country."

President Chadbourne, of Williams College:

". . . We avail ourselves of the occasion to express our gratification at the great success of Lafayette College in the good work of sound education, and especially to congratulate you on this munificent donation, so valuable to you in your work, so honorable to the liberal giver."

President Stearns, of Amherst College:

". . . Pardee Hall, with its uses, as appointed, is certainly a grand gift and addition to your college. I rejoice with you, and congratulate the donor on his possessing that nobleness of heart which has induced the munificence. Men of means are not always men of generous ways. But when we find men of this character, we may thank God not only for their gifts, but still more for the manhood which induces the gifts."

President Fairchild, of Oberfin College:

". . . We are glad to add our congratulations to those of many others upon this evidence of your enlargement and prosperity. May PARDEE HALL long stand an honor to its founder and to Lafayette College and a blessing to many generations."

Similar congratulations and expressions of fraternal feeling and good-will were received from President Porter, of Yale; President Eliot, of Harvard; President Angell, of Michigan University; the Faculty of Washington and Lee College, Virginia; President Cummings, of Wesleyan University; President Brown, of Hamilton; President Hodge, of Madison University; President Robinson, of Brown University; President Purnell, of Delaware College; President Potter, of Union College; Chancellor Winchell, of the Syracuse University, and others.

RESOLUTIONS.

RESOLUTIONS OF THE BOROUGH COUNCIL OF EASTON, PASSED OCT. 3, 1873.

Resolved, That Council accept the invitation of the authorities of Lafayette College to attend the exercises connected with the opening and dedication of Pardee Hall, and will gladly avail themselves of the opportunity to testify their appreciation of the great value of Lafayette College to the country at large, and especially to this town and neighborhood; and also to give some expression of their gratitude to Mr. Pardee, through whose munificence the Scientific Department has been endowed and this noble building erected for its use.

Resolved, That our citizens be recommended to close their places of business in the afternoon of the day of the ceremonies, to join in a procession to receive Mr. PARDEE, the Trustees of the College, and other distinguished visitors, and to attend the exercises upon College Hill, at the opening of the new Hall.

Resolved, That a committee be appointed in connection with a committee of our citizens to confer with Mr. PARDEE to ascertain whether it will be agreeable to him on the evening of October 21st, to receive the citizens of Easton, who desire on that occasion to call upon him and testify their respect for him and their appreciation of the noble gifts made by him to the College, which have secured the permanence, usefulness and efficiency for all time to come of an institution which gives such certain promise of blessing to our whole country, by affording to our young men of all classes the opportunity of securing at a moderate expense a most thorough, practical education, qualifying them to fill with honor and usefulness the various positions in life they may be called upon to occupy.

RESOLUTIONS OF THE SCHOOL-BOARD OF EASTON, PASSED OCT. 3, 1873.

Resolved, That this Board, appreciating the eminence Lafayette College has attained among the highest institutions of the country, and believing that the occasion, in which it is asked to participate, should be made worthy of the munificent gift of Mr. PARDEE, as well as promotive of the further reputation and influence of the college and of all our educational institutions, hereby accept the invitation proposed.

Resolved, That as the Board of Control, representing the school interests of the borough and recognizing the intimate relations existing between all departments of popular education, we take pleasure and pride in the marked growth of the college, and especially in the enlarged and multiplied facilities for the prosecution of a technical or scientific course, thus inviting and offering a more efficient preparation to young men for the varied industrial pursuits of life.

Resolved, That in its Faculty of twenty-eight Professors and Tutors, its enlarged classes, its flattering prosperity and its widening fame, we see an augury of still

greater progress in the future, plainly indicating that it will soon be one of the first American institutions, embracing in its wide range of instruction every qualification for professional practical life and every resource for private culture or public usefulness.

Resolved, That we regard the Pardee Hall a grand memorial of wise and unselfish beneficence, claiming our public and recorded thanks to the generous donor for so liberal an expenditure in so vital and general an interest.

Retolved, That on the afternoon of Tuesday, October 21, the public schools be closed, and the teachers of the same, with the pupils of the High School, meet at I o'clock at this office, to join the Board of Control in the general procession.

RESOLUTIONS OF THE SYNOD OF PHILADELPHIA, PASSED OCT. 19, 1873.

Resolved, 1st. That we have heard with admiration and grateful interest, of the signal munificence of ARIO PARDEE, ESQ., in the erection and furnishing of a building for the Scientific Department of Lafayette College, so magnificent in its proportions, so complete in its appointments, and so admirably fitted for the use of one of the most important institutions in our land.

- 2d. That as Representatives of the Church we offer to Mr. PARDEE our heart-felt thanks for this and all his previous benefactions for the College: and we pray that the blessing of Him who "loveth a cheerful giver" may be richly manifested in all his experience.
- 3d. That we rejoice in this new evidence of the prosperity of that Institution which has been planted in the interests of our beloved Church, and the benign influence of which is being more and more widely felt throughout the Christian world.
- 4th. That we congratulate our Brother, President CATTELL, on the marked success which has crowned his self-denying and courageous efforts for the enlargement and permanent endowment of this Institution, and that we extend to him and his able colleagues in the faculty, the assurance of our best wishes and prayers for their long life and prosperity in the good work in which they are engaged.
- 5th. That we accept the invitation to attend the dedication of Pardee Hall, on Tuesday next: and that our special thanks are due to the North Pennsylvania and Lehigh Valley Railroad Companies, for the facilities they have extended.

DIRECTORY.

The letters refer to the diagram of the different floors; the numerals to the figures placed upon the doors in the building.

FIRST FLOOR.

A. B. (1-3.) Metallurgical Lecture Room and Private Laboratories.

C. (4.) Blowpiping. D. (5.) Balance Room. El. (6.) Assaying.

F. (7.) Janitor's Office. Gl. (8.) Unpacking Room, with Elevator.

H. (9.) Assay Stores. I. (10.) Apparatus, Civil Engineering. J. (11.)

Laboratory, Dressing Ores. K. (13.) Photometry. L. (12.) Laboratory,

Volumetric Analysis. M. (14.) Laboratory, Crystallization. N. (17.)

Laboratory, Organic Analysis. O. (16.) Laboratory, Gas Analysis.

P. (15.) Lecture Room, Applied Chemistry.

SECOND FLOOR.

A. B. C. (18-20.) Mineralogical Lecture Room and Private Laboratories. D. (21.) Study of Professor of Mineralogy and Metallurgy. E. (22.) Metallurgical Cabinet. F. (23.) Mineralogical Cabinet. G. (24.) Main Lecture Hall. H. (25.) Ante-Room. I. (26.) Geological Cabinet. J. (30.) Reading Room. K. (29.) Study of Professor of Geology. L. (27.) Geological Laboratory. M. (28.) Geological Lecture Room.

THIRD FLOOR.

A. B. (32, 33.) Cabinet of General Models, Mining Engineering. C. (31.) Lecture Room, Mining Engineering. D. (34.) Study of Professor of Mining Engineering. E. (35.) Cabinet of Models, Mining Engineering. F. (36.) Drawing Room, Mining Engineering. G. (37.) Gallery to Lecture Hall. H. (38.) Music Gallery. I. (39.) Drawing Room, Civil Engineering. J. (44.) Cabinet of Models, Civil Engineering. K. (43.) Lecture Room, Civil Engineering. L. (40.) Working Models, Civil Engineering. M. N. (41-42.) Study of Professor of Civil Engineering.

FOURTH FLOOR.

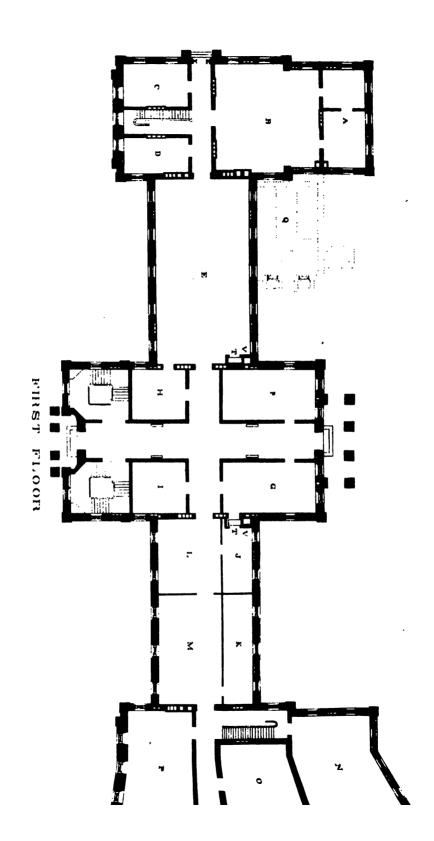
A. B. C. (45-47.) Chemical Lecture Room and Private Laboratories. D. (48.) Study of Professor of Chemistry. E. (49.) Sulphydric Acid Room. F. (50.) Laboratory, Qualitative Analysis. G. (51.) Technological Cabinet. H. (52.) Assistant's Room. I. (53.) Spectroscope Room. J. (55.) Laboratory, Quantitative Analysis. K. (59.) Laboratory, Original Research. L. (58.) Laboratory, Technical Chemistry. M. (57.) Balance Room. N. (56.) Sulphydric Acid Room. O. (54.) Study of Professor of Analytical Chemistry.

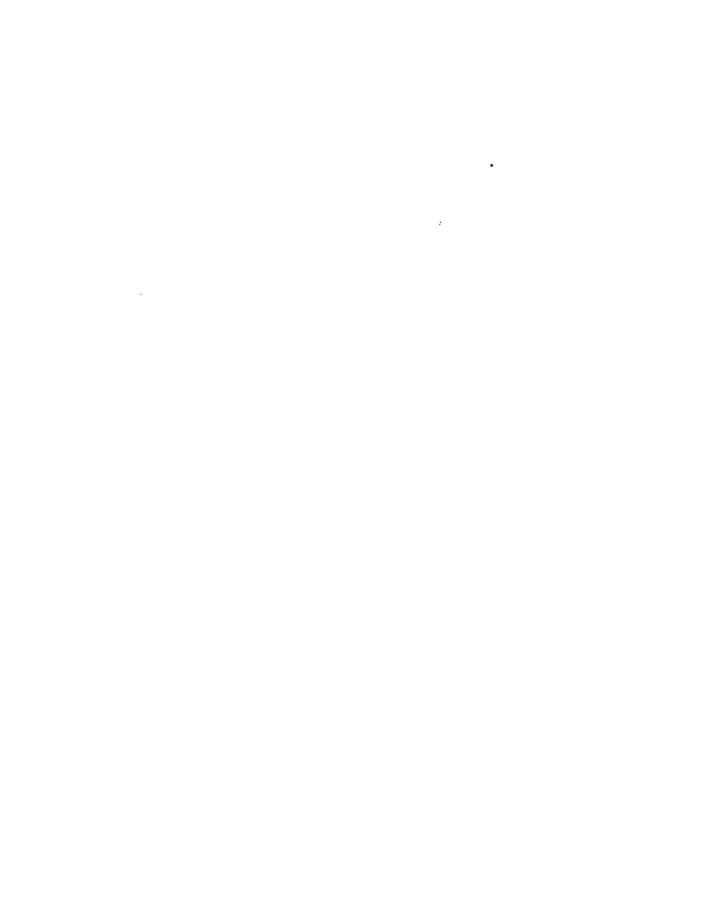
FIFTH FLOOR.

(61.) Laboratories, General Chemistry.

The centre building is 53×86 feet; the lateral wings are 61×31 feet; and the cross wings 42×84 feet. The entire length of front, in a straight line, is 256 feet. The material is the Trenton brown stone, with trimmings of light Ohio sandstone. The building is heated throughout by steam, and lighted by gas.

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DIRECTORY.

The letters refer to the diagram of the different floors; the numerals to the figures placed upon the doors in the building.

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A. B. (1-3.) Metallurgical Lecture Room and Private Laboratories.

C. (4.) Blowpiping. D. (5.) Balance Room. E. (6.) Assaying.

F. (7.) Janitor's Office. G. (8.) Unpacking Room, with Elevator.

H. (9.) Assay Stores. I. (10.) Apparatus, Civil Engineering. J. (11.)

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THIRD FLOOR.

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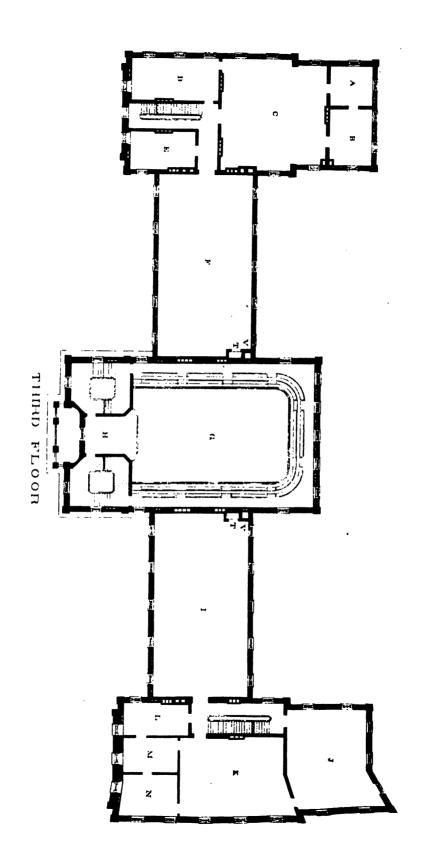
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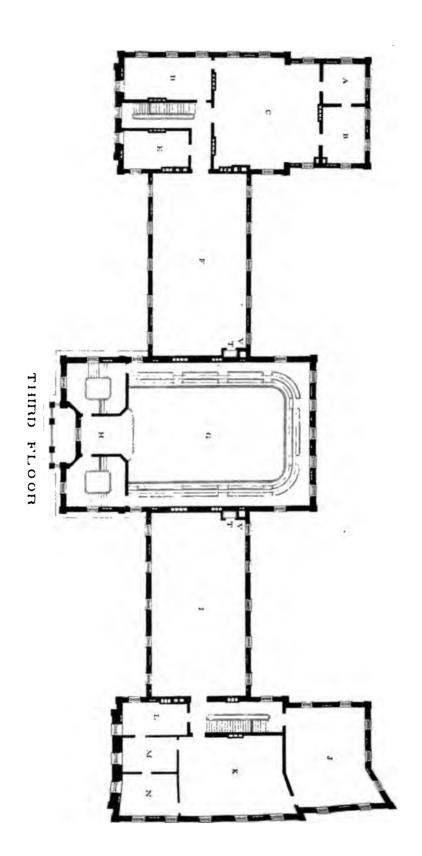
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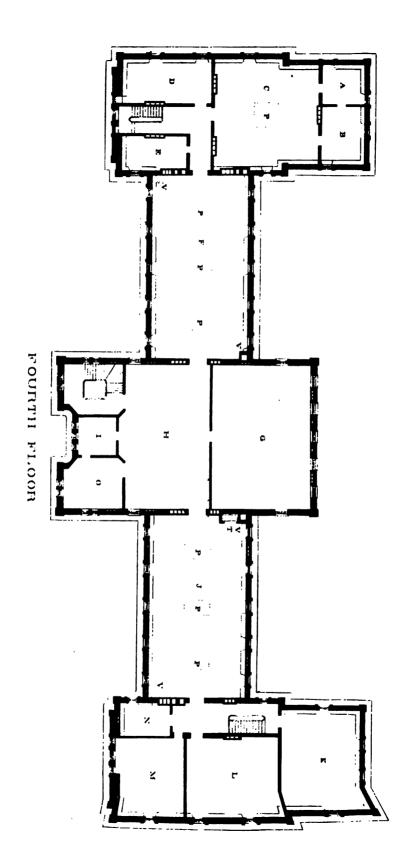
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A DISCOURSE

PREACHED AT THE

DEDICATION OF THE CHAPEL

AT

LAFAYETTE COLLEGE,

MARCH 12, 1873.

. BY

REV. N. A. GAYLEY,

PRESIDENT OF THE ALUMNI ASSOCIATION OF LAFAYETTE COLLEGE.

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EASTON, PENN'A.
1873.





A DISCOURSE

PREACHED AT THE

DEDICATION OF THE CHAPEL

AT

LAFAYETTE COLLEGE,

MARCH 12, 1873,

BY

REV. S. A. GAYLEY,

PRESIDENT OF THE ALUMNI ASSOCIATION OF LAPAYETTE COLLEGE.

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DISCOURSE.

"Now will I sing to my well-beloved a song of my beloved touching his vineyard. My well-beloved hath a vineyard in a very fruitful hill. And he fenced it, and gathered out the stones thereof, and planted it with the choicest vine, and built a tower in the midst of it, and also made a winepress therein: and he looked that it should bring forth grapes, and it brought forth wild grapes. And now, O inhabitants of Jerusalem and men of Judah, judge, I pray you, betwixt me and my vineyard. What could have been done more to my vineyard, that I have not done in it? Wherefore, when I looked that it should bring forth grapes, brought it forth wild grapes?"—ISAIAH V. 1—4.

THE prophet, by this parable of a vineyard, in selecting for it a favorable site, "on a fruitful hill," in the thorough preparation of the soil, gathering out the stones thereof, in fencing it in, planting it with the choicest vine, building a tower in its midst, and in making a wine-press in it, presents the completeness of the Divine provision made for Israel.

As the husbandman who has exercised so much care and attention, and bestowed so much labor upon his vineyard, has reason, in the natural course of things, to expect suitable returns as the reward of his expenditure, so the prophet teaches that God, who had made such provision for Israel, having omitted nothing, in the arrangements of his grace, calculated to promote their spiritual fruitfulness, in fidelity to himself and obedience to his will, had reason to expect corresponding fruits. Nothing had been left undone that divine wisdom could devise and divine goodness provide; but when he looked for his vineyard to bring forth grapes, it brought forth wild grapes. With propriety he asks, "What could I have done more for my vineyard that I have not done to it?"

The application of the passage is obvious, and needs no lengthy exposition. The truth inculcated is that when God has furnished means and opportunities for moral and spiritual improvement, he justly looks for corresponding fruits. To whom much is given, from them much is required.

Leaving this obvious application of the passage, my object

will be to point out the adaptation of the system of truth revealed in the Bible, and of the instituted means of grace to the nature and wants of man, or the completeness and suitableness of the arrangements of divine grace for the accomplishment of the divine purpose in his salvation.

The salvation of fallen man is the clearly expressed purpose which God designs to accomplish by the gospel. As he is infinitely wise, the means selected to accomplish this end must have a wise adaptation to human nature, which they are designed to influence. This is simply to ascribe to him the attribute of intelligence which we must accord to a being who possesses in himself the sum of absolute perfection. It is but reasonable to suppose that the contents of the revelation he has given us as the appointed means of our salvation, have a special adaptation to our nature, which they are designed to purify, ennoble, and exalt to communion with himself.

The examination of this revelation cannot fail to convince every unbiassed mind of its eminent suitableness to meet man's intellectual and moral wants, and to influence him to the love and service of God.

1. The character of God, as revealed in the Bible, meets the demands of our nature for a supreme being to worship and serve.

The being of God is the primary truth in morals and religion. The demand for such a being is the imperative and most controlling instinct of our nature.

The history of the race conclusively proves that man must have a God to worship, fear, and serve, and to whom he can resort for assistance in times of pressing need. In the absence of the clear revelation of the true God, he makes one for himself, by a deification of the forces manifest in nature, to which he ascribes personality and perfection, whom he makes lord of his conscience, and to whom he renders the supreme homage of his heart. The universality of this fact, that man; wherever found, and in whatever state of civilization and enlightenment, has some being or beings whom he worships, fears, and serves, and which controls his life, evinces the imperativeness of this demand of human nature for a God. But whilst these false deities of the heathen in a measure meet and satisfy the demands of the conscience and the heart, they do not fully satisfy the urgent moral wants of man. The

enlightened and inquiring of the heathen, in every age, felt and expressed their dissatisfaction with the popular systems of religion, and their unbelief in the gods. Earnest and thoughtful minds ever realized their insufficiency to satisfy the deep yearnings of their souls.

But the God of the Bible, as self-existent and eternal, as embodying in himself the sum of absolute perfection, the Creator of all things, the supreme Governor of the universe, and the final Judge, dispensing retributive justice to the bad and rewarding the good, clothed with the attributes of omnipotence, majesty, justice, and holiness, meets in the fullest sense the demand of our nature for a being who will inspire us with feelings of reverence and fear, and as an object worthy of our worship and obedience. Moreover, his love, mercy, sympathy with mankind, considered not as a mere physical force, nor as the vital principle in nature, nor as an unconscious and unintelligent absolute Being, inseparable from the universe, but as an extramundanc, personal God, standing in intimate relations to man and to all human affairs, upholding all things, and governing all his creatures and all their actions, and, moreover, revealed in the character of a Father, and especially as manifested in the person of Jesus Christ,—able to sympathize with us in affliction, to succor us in need, to provide for our necessities, to guide us in perplexity, and as the hearer of prayer, the demand of the affections and our sense of absolute dependence are fully met. The God of the Bible, in his sterner attributes of power, majesty, justice, and holiness, meets the demands of the conscience and of those moral instincts that demand an object of worship and reverence, whilst the milder features of his character satisfy the demand of the affections for a being worthy of supreme love. His revealed character, when apprehended by the enlightened mind, is felt to correspond to the conscious instincts of our nature, and to him the supreme homage of the soul and the affections of the heart are cheerfully and voluntarily rendered. In him the soul finds its counterpart, its centre, and its rest. Its language is, "He is all my desire."

2. The Bible, as a revealed system of positive and infallible truth, is suited to the nature of the human mind.

The religious history of the race clearly demonstrates that systems of morals and religion have never been embraced as

the deductions of the reason. True, there have been instances of attempts to construct philosophic systems based on purely rational principles; but these speculative systems have ever failed to take any extensive hold upon the human mind. The masses never embraced them. The various religious systems of heathenism have been received as positive and infallible revelations of the gods. All heathen sects have their sacred books or traditions, which are regarded as embodying the doctrines, precepts and rites given by special revelation, and as such, are they received as authoritative and infallible as a rule of faith and practice. Thus the Vedas of the Hindoo, the Zend-avesta of the Parsees, the sacred books of the Buddhists, the Koran of the Mohammedans, and the unwritten traditions of the unlettered African, are received as positive divine revelations, and not because they have been tested and approved of by human reason. This fact which is everywhere observed, evinces the tendency of the human mind and its imperative demand for a positive and infallible system of revealed truth, for an authority that is divine, as a foundation of its faith.

Religion and morals have respect to a being superior to ourselves; hence the religious element of our nature instinctively leads us to look to a superior being as the authoritative source of a system of religion and morals. The human mind cannot give its homage to any system that is regarded as of human origin, without doing violence to its instincts and the laws of its operation. It imperatively demands a revelation that is divine, on which, without doubt and uncertainty, faith may steadfastly rest, and the anxious and agitated soul may find repose. Rationalism, by its indefiniteness and uncertainty, offers no secure refuge to the weary spirit. It is like the broad and agitated deep on which the dove of Noah could find no resting-place, but had to return again to the ark; so the wearied soul of man has ever turned away from its unsatisfying speculations, and sought refuge in the ark of what was regarded as divine revelation.

But moreover, religious truth necessarily, from its very nature, involves the supernatural, and contains mysteries transcending the comprehension of the human mind, and which cannot be tested at the bar of reason, but which can only be received by simple faith. Thus every consideration of the nature of the subject, of the mind, its most intense instincts

and its clearly developed tendency, demonstrate that nothing but a divinely revealed positive system of truth can satisfy its demands. The truth embodied in the Scriptures, revealed by Jehovah, who is infinite, eternal and unchangeable, meets and satisfies the demands of our nature. There is in its author the highest authority and most consummate wisdom, spotless purity and undoubted veracity, which answer the requirements of faith. That supreme authority as the foundation of religious faith, which the unenlightened ascribe to their divinities, is here found in the fullest sense, in the author of the Bible.

The contents of this revelation, too, are wisely adapted to the human mind, in that they instruct man in those things which satisfy his earnest inquiries, and meet the felt necessities of his religious nature. The character of God, man's relation to Him and his fellow-men, the duties springing therefrom, how he may serve God acceptably and secure his favor; and above all, it opens to him the future, unfolds the life of happiness and glory that remains for those who acceptably serve God here, and the darkness, misery and eternal wretchedness that await those who serve Him not.

It covers the whole field of moral and religious thought and inquiry, and furnishes positive, definite, and satisfactory answers to the deepest and most urgent yearnings of the soul. Whilst human speculation leaves man's anxious and agitated spirit tossed upon a shoreless sea of uncertainty, and overhung with dark and gloomy clouds, that exclude the light of day, the Bible opens to it a haven of peace and security, light, and joy, and rest forever.

3. The duties it inculcates and enforces commend themselves to the enlightened conscience. Conscience is that faculty which judges of the moral quality of actions. It spontaneously gives its approbation to what it perceives to be right, and its disapprobation to what it perceives to be wrong. In its decisions it is not arbitrary, but has respect to a law as a standard of moral action, which it simply executes. This law is regarded as the enactment of an authoritative and competent Lawgiver; one that is not human, but divine. Man, from the moral instincts of his nature, cannot accord to a fellow-mortal supreme lord-ship over his conscience, and receive from him a law to regulate his moral conduct.

Conscience, in a special sense, is that principle or faculty

which binds man to a superior being, and produces in him the feeling of moral dependence upon a higher power. It demands a divine being to whom it cheerfully accords the prerogative of lordship, and the right to prescribe a rule of moral action, and which it spontaneously enforces. Its dictates harmonize with accepted moral law.

The conscience of the heathen enforces the law conceived as given by the gods, to whom, in their ignorance of the true God, they have given their allegiance. If conscience enforces a false morality, it is because of its blindness and ignorance of a purer law, as its dictates are in accordance with its light. The God of the Bible, who is infinite in perfection, and is revealed as moral governor and final judge, meets the demand of the conscience as Lord and Lawgiver. The moral code revealed in the Scriptures commends itself to the enlightened conscience, and its duties accord with its innate or intuitive perceptions of justice and of right. It is perceived to be a comprehensive and perfect rule of moral action, and however much the heart, in its attachment to sin, may be opposed to the law of God, yet the conscience regards it as holy, just, and good, and lifts its voice in testimony in its behalf. The conscience of even the most abandoned profligate, and of the most decided sceptic, gives its approbation to the purity of the morality inculcated in the Bible. However widely their conduct may be at variance with its precepts, there is still within them the voice of conscience, bearing witness in its favor, whose utterances cannot be altogether silenced. The seal is no more perfectly adapted to the wax upon which it leaves its impress, than are the precepts of this divine law to man's moral nature. Nor more certainly does the musical instrument respond to the skilful touch of the accomplished performer, than the enlightened conscience, in feelings of approbation to the duties it enjoins. It is seen to be authoritative as the law of the great King with whom we have to do, and to be perfect, holy, just, and good.

4. The revelation contained in the Bible is adapted to the affections. Whilst the intellect has respect to the true, the conscience to the right, the heart or affections have respect to what is good. The affections demand something to admire and love, something to embrace. A revelation whose design is to meet human wants, and to effectually influence man for good,

to bring him in character and life into harmony with the divine nature and will, and that would overlook the claim of the affections, would necessarily be incomplete, inasmuch as the most important part of man's nature would be unprovided for. The affections are in a more special sense the seat of character and of power. There reside the forces that determine volition, and are the spring of human action. "Out of the heart are the issues of life." "As a man thinketh in his heart, so is he."

In this respect the truths contained in the Bible, and especially the gospel of the grace of God, are wisely suited to our nature. In the God of the Bible, not inaccessible to us, dwelling in eternal solitude, as a mere spectator of his works, but in intimate relations to us, as He in whom we live, and move, and have our being,—as our Father, possessing in an infinite degree the characteristics of an earthly parent; a God of love, mercy, compassion, goodness; of tender sympathy, and interest in our welfare, there is not only everything to admire, but everything to expel distrust, and to engage the choicest affections of the heart. But it is as He is revealed to us in Christ Jesus, and as manifested in his perfect life of righteousness, in his self-sacrificing love for our sake, in his tender and large sympathies with us in our alienation, weakness, sorrows, and diversified trials, that He specially commends himself to man, not only as worthy of his deepest gratitude, but of his fervent love. In the gospel there is revealed the most ample provision for our spiritual need. It furnishes a satisfactory answer to the pressing inquiry of the soul, "How shall man be just with God?" in a way that satisfies the enlightened mind, and the demands of the conscience, and brings peace and satisfaction to the heart. There is an antidote for every ill, a balm for every wound, and a cordial for every fear; light in darkness, strength in weakness, joy in sorrow, deliverance from temptation, and every form of evil; protection from every danger, and victory in every conflict. In a word, all the good that man can possibly desire, and which can fill the soul with the highest joy and fullest satisfaction, is revealed and promised in the gospel. It spreads before man, not the dry and innutritious husks of human systems, but a rich and satisfying feast—a feast of fat things, full of marrow; of wines on the lees well refined.

5. But further, the Scriptures contain every motive that is

adapted to influence man to right action. Man is generally influenced in his conduct by conviction of duty, fear of evil, or the hope of reward. Would we influence human action? we appeal to some or all of these principles. So God in dealing with man has not overlooked the constitution he has given him as a free agent, nor the laws of the human mind. He aims to influence him in a rational way, by bringing motives to bear upon him, and thereby sway the principles of human action. In the Bible there is everything in the explicit revelation of the divine law to convince man of duty, and to enforce the obligation of a virtuous and holy life; and in the character of God, as clothed with omnipotence, rigid justice and spotless holiness, who cannot abide iniquity, and will by no means spare the guilty, in his dread threatenings against all ungodliness, and in disclosing a judgment to come, and the doom of the wicked to the endless torments of hell, there is everything to operate upon his fears, to deter him from perseverance in the ways of sin.

So also in the mercy and compassion of God, the free offer of forgiveness and reconciliation through the Redeemer, the promise of divine grace in every time of need, and in drawing aside the veil, and giving a glimpse of the perfect bliss and joy and glory of heaven, as the reward of a life of godliness, there is every motive to allure him into the paths of true holiness. In a word, there is every motive addressed to man in the gospel, that in a rational way is calculated to sway the conscience and the heart, to detach him from sin, and influence him to the love and practice of true holiness.

6. Man is not left to the mere influence of truth and the force of motives, for so strong is the reigning power of sin in his heart, that no force of argument or of motive could avail to effect a change in his character and life. There is, in addition to all this, the gift of the Holy Spirit, whose office is to interpret the truth, and to make it bear with greater power than the mere force of argument upon the understanding and the heart. The Spirit, with an energy that is divine, brings home the truth with convincing power to the mind, and wields the appeals with impressive effect upon the conscience and the heart, to influence man to turn away from sin, and to allure him to a life of piety and virtue. The truth in itself, however perfect in its adaptation to man's intellectual and moral nature,

and however well suited to influence him for good, yet through the darkness of his mind and the deadness of his heart, is inefficacious to salvation. But in the hand of the divine Spirit, it is light, and life, and power.

Lastly. We would notice the adaptation of the means whereby the truth is brought into contact with the mind, which we have in the sanctuary and its ordinances, and a living ministry.

- I. The house of God.
- (1.) This, in connection with the Sabbath, furnishes the opportunity for religious culture. In the pressing engagements of worldly business and occupations of daily life, engrossing his attention, man thinks but little and reflects less upon his spiritual destiny. But within the sacred precincts of the courts of the house of the Lord, withdrawn from the whirl of business, the engrossing cares, the agitations and conflicts of life, the sacredness of the associations, the solemn services of divine worship, and the messages of God's truth, are calculated to recall him from his forgetfulness of his moral accountability, to force upon him calm and serious reflection, and to arouse him to a sense of duty to his God and to his own soul. Without stated times and a place for worship, and religious instruction, the truth, however well adapted to man's spiritual nature, would be almost powerless for good. The end for which it is given would be defeated. There is in the human heart such an obstinate disinclination to give attention to spiritual things, that only by frequently bringing to bear upon him the power of divine truth, is he led to the consideration of his spiritual condition. The sanctuary is the complement of the truth; it gives completeness to the system of means for effecting man's spiritual regeneration.
- (2.) It is adapted to man's social nature. Man is a social being; his sphere of action is in association with his fellows. His social nature in a great measure moulds and shapes his whole being. Through it is he most effectually influenced for either good or evil. His associations leave their indelible impress upon his character. Companionship with the immoral and depraved brings him to their own level, whilst association with the good, tends to lift him up to the same plane of virtue and morality. It is also a matter of observation and experience, that mankind in masses are more easily and more

effectually impressed and influenced than in isolation, which demonstrate the power of the social feelings, and of that electric and subtle power of sympathy communicated from heart to heart by association. To make no provision for man's social nature, would be to overlook the most effectual means to influence him for his spiritual good. This is provided for in the institution of the sanctuary, a place of public assemblage, wherein the services of prayer and praise, and under the dispensation of the truth, heart in contact with other hearts, the social feelings have the fullest play, and are influenced for the highest spiritual ends.

(3.) But further, the sanctuary is the depository of spiritual power. This not merely from its sacred associations and ordinances of worship, which of themselves have a moral influence, but because it is the residence of the Great King. Not in the cloud as in the temple, but in the presence and power of the Holy Spirit. Zion is his seat. This renders the ordinances of worship not a mere empty ceremonial, but vehicles of spiritual power to the soul, and makes the truth the rod of divine strength for subjugating the heart to the supreme love and service of Jehovah. It is the chosen instrumentality for awakening the dead soul, and producing repentance and culturing it for the heavenly world.

II. In connection with the house of God, is the living ministry. Divine truth must not only be revealed through the medium of the human mind—be cast in the forms of human thought and embodied in human language, that man may apprehend it; but the living teacher is God's special ordinance, to bring the truth to bear with the greatest power upon his mind and heart. This was his ordinance in the old as well as it is in the new dispensation. In the old, the religious instruction of Israel was not left exclusively or chiefly to the priests and Levites, who were mainly occupied with the performance of the . rites of worship. It was chiefly entrusted to the prophetical order. A few of these possessed the extraordinary gift of inspiration for the communication of new truth, but the ordinary function of even these, as well as of the great body of the prophets, was that of teaching, inculcating and enforcing upon the people the moral and religious truths delivered by Moses. It was by their ministry that the truth was kept before the people, that their minds were leavened by its influence, and

that Israel fulfilled her high mission, which was to maintain and to give the true religion to the world. The method of their teaching was by oratory, free and direct addresses to the people, bringing the truth in fresh and living contact with their minds.

In the new dispensation, God's ordinance for making his truth most effective to accomplish its great end—man's moral and religious elevation—is the living ministry, whose prototype is not the priesthood, but the prophetic order of the old dispensation. Their great function is not to perform ceremonies—it is higher and more spiritual—it is to preach the gospel. They are stewards of the mysteries of God, ambassadors for Christ. Their office, like that of the prophets of old, is to expound, inculcate, and enforce the truths contained in the Scriptures; to bring them in living contact with the human mind.

In the selection and ordination of this instrumentality for making divine truth effective in influencing mankind, divine wisdom had respect to human nature. There is in man such a disinclination to spiritual things, that left to himself, though possessed of the sacred Scriptures, they would remain unpe-Their truths must be repeatedly brought before him, to secure and enlist his attention. He must have line upon line, and precept upon precept, which can only be done by an order of men set apart for this purpose. Israel, notwithstanding the ordinances of the temple, and though possessed of the law given by Moses, would have lapsed into idolatry, but for the ministry of the prophets. And so, still, the Bible would be comparatively powerless, but for the labors of the ministry. In those portions of our land where there is not the living spiritual teacher, ignorance and moral darkness reign, and there is moral and spiritual degradation.

But the living voice is the most effective means of bringing the truth to bear with the greatest power upon the soul in producing conviction, exciting feeling, and in arousing men to action. The truth on the printed page, like the light of the stars, may be clear, but it is cold, whilst as uttered by the living man, it is like the light of the sun, not only clear, but warm and life-giving. There is in the eye, the voice, and the expression of feeling and passion in the living teacher, that which imparts a persuasive and impressive power to the truth uttered, which no other means possesses. All experience proves

the superior efficacy of this means to influence and sway the mind and heart of man. The demagogue employs it as the most effective instrument for accomplishing his selfish ends, and the errorist as the most successful means of propagating his faith; so it is God's chosen instrumentality for man's salvation.

We have thus endeavored to point out the completeness of the adaptation of divine revelation to man's intellectual, moral, and religious nature, and of the means whereby the truth may be brought the most effectively to bear upon him, to detach him from sin, and influence him to the service of God; to lift him from his moral degradation and wretchedness, and raise him to fellowship with his God, in endless happiness and joy. Throughout the whole there may be traced a wisdom that is infinite, a hand that is divine. In view of this subject, we may well ask with the prophet, What could God do more for man that He has not done? If unsaved, he is without excuse.

In conclusion, as suggested by the occasion, we would notice the importance of the chapel in its relation to the college.

The college, however complete its appointments in other respects, yet if there be no provision for divine worship and religious instruction, is incomplete in its agencies to give to youth the highest culture. The halls for secular instruction and the chapel for spiritual, are complements of each other. are necessary parts of a complete system of means for training youth for the greatest usefulness. The influences that go forth from the chapel are advantageous in various ways. The daily devotional exercises and the exposition of divine truth are favorable to intellectual activity and progress. By their silent influence upon the conscience, developing the sense of moral obligation, and by repressing the evil impulses of the heart and calming the agitations of the soul, the mind is brought into a frame better fitted for patient thought and earnest investiga-But divine truth, by its purity and the sublime themes it presents for consideration, furnishes a healthy stimulus to thought, which tends to invigorate the mental powers. It provides the purest and most wholesome pabulum for the mind. which is conducive to its health and vigorous activity.

But not only as the handmaid of intellectual development is the influence of religious worship and instruction valuable, but in a higher sense, as the direct means of spiritual culture. Man is not merely an intellectual, but a moral and religious being. A system of education that does not recognize the latter must be defective. Mere intellectual development and acquirements are not the highest desiderata, but rather these conjoined with high moral and religious culture. The highest type of scholarship is Christian scholarship. Mere secular learning, divorced from religion, is not only defective, but its tendencies are atheistic. Not only the immortal interests of the youth are immediately and directly concerned, but indirectly the interests and the welfare of society, in the religious. instruction of the college. The educated classes hold the posts of influence in the community; they impress upon society their own sentiments and their own character. The colleges where their characters are formed are the great fountains of influence, and how important that they be leavened with divine truth and evangelical piety.

The college and the university have ever been mighty-instruments for the propagation of either truth or error. Through the universities in Germany, rationalism spread its baleful influence over the land, sapping the foundation of true religion. In France, through the influence of the materialistic philosophy in the universities, there resulted social disorganization and atheism. In the Reformation they were the most potent agencies for the diffusing of its principles. They were centres of light and power.

Let our colleges be leavened with infidelity, be seats of error, and in time the land will be flooded with impiety and irreligion. The influence of the college is not even second to that of the Christian church, as from the college the ranks of the ministry are filled, who bear the impress of its teachings, and reproduce it in the sentiments and character of the people. The influence of the college is far-reaching; it is felt in every hamlet and cottage of the land. Every social and religious interest is deeply concerned in the religious character of our colleges.

This Institution from its foundation has been distinguished for the prominence given to God's holy word and the religious influence exerted upon its students. It was founded in the interests of true religion, and was consecrated with prayer. Dr. Hodge has said, "The character of an institution is determined by the character of its first teachers, who infuse into it their own spirit, and impress their own character indelibly upon it." The first President of this College was a man whose

piety was deep, ardent, and evangelical, who ever magnified the word of God in his instructions, and who, as much as any man, left his impress upon his students. Few left these halls, under his administration, if not truly pious, without at least a reverence for the word of God and a respect for true religion.

The Institution still retains the same character. Men of like spirit, of deep and ardent piety, and sound in the faith, have succeeded to its administration, men who ever exalt God's truth, and seek the highest spiritual interests of her students. She has the preeminence of being the first, in our land, to elevate the Bible to be a text-book in her curriculum. She has honored God, and God has honored her, in giving her almost unprecedented success, and above all, in the copious effusion of his Spirit upon her students.

And this chapel, which we this day set apart to its holy mission, evinces the determination of her friends, Trustees, and Faculty to maintain her Christian character and her high standard of sound Christian culture. Long may she enjoy this preëminence, and ever prove a fountain of blessing to our country, to the Church, and to the world.

But I would simply add, that this edifice, though like Zion of old beautiful for situation, with its chaste architecture, the beauty of its adornments, and the completeness of its appointments for comfort and convenience, and even with a learned, able, and eloquent ministry occupying its desk, will be nothing unless it be the residence of the Great King. This will be its greatest glory. The presence and power of the Holy Spirit can only make it in the truest sense a place of prayer, and impart to the truth here dispensed a saving power. No external appliances can compensate for lack of this. But with His presence, the ordinances here administered will be instinct with light, life, and power.

And may we not in this auspicious hour breathe the prayer, "Come, Lord, take possession of this house and fill it with thy glory."

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AT THE

REOPENING OF PARDEE HALL,

LAFAYETTE COLLEGE,

NOVEMBER 30, 1880.

BY

FRANCIS A. MARCH, LL.D.,

PROFESSOR OF THE ENGLISH LANGUAGE AND OF COMPARATIVE PHILOLOGY IN LAFAYETTE COLLEGE.

WITH AN APPENDIX

CONTAINING A REPORT OF OTHER ADDRESSES AND THE GENERAL PROCEEDINGS OF THE DAY.

PRINTED BY ORDER OF THE BOARD OF TRUSTEES.

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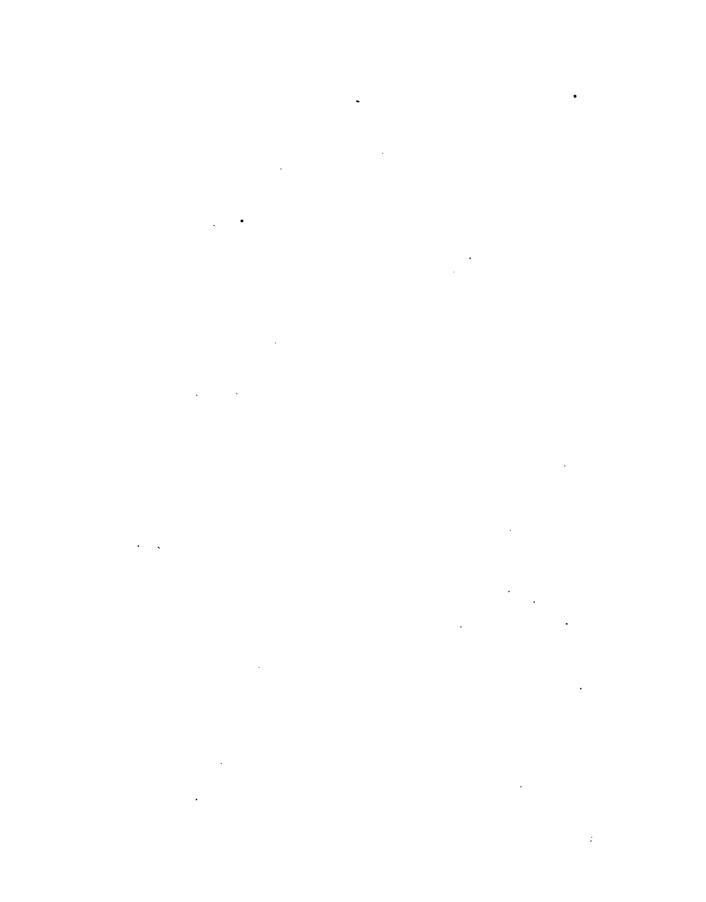
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EASTON, PA.

1881.









AT THE

REOPENING OF PARDEE HALL,

LAFAYETTE COLLEGE,

NOVEMBER 80, 1880.

BV

FRANCIS A. MARCH, LL.D.,

PROFESSOR OF THE ENGLISH LANGUAGE AND OF COMPARATIVE PHILOLOGY IN LAFAYETTE COLLEGE.

WITH AN APPENDIX

CONTAINING A REPORT OF OTHER ADDRESSES AND THE GENERAL PROCEEDINGS OF THE DAY.

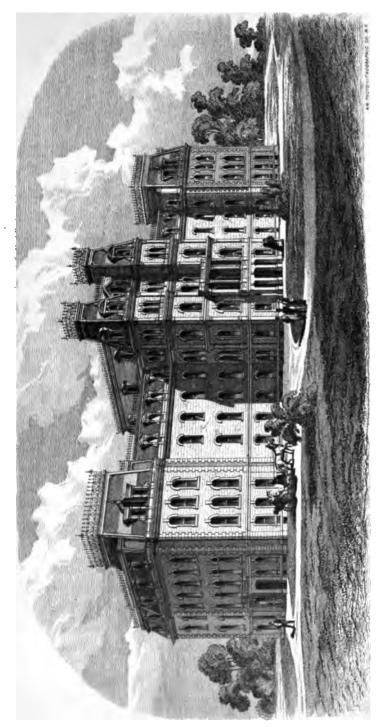
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EASTON, PA.

1881.







PARDEE HALL.

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AT THE

REOPENING OF PARDEE HALL,

LAFAYETTE COLLEGE,

NOVEMBER 80, 1880.

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FRANCIS A. MARCH, LL.D.,
PROFESSOR OF THE ENGLISH LANGUAGE AND OF COMPARATIVE
PHILOLOGY IN LAFAYETTE COLLEGE.

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ADDRESS

OF

FRANCIS A. MARCH, LL.D.,

PROFESSOR OF THE ENGLISH LANGUAGE AND COMPARATIVE PHILOLOGY IN LAFAYETTE COLLEGE.

We meet to-day as friends of education, and, therein, lovers of our country and of our race, to celebrate the completion of this Hall of Science—Pardee Hall—and to honor its founder.

Addresses of welcome and of thanks have been made; addresses of congratulation are to follow. This address is to set forth in a summary manner the uses of the hall, the nature of its equipment and apparatus, and the part they play in education. And such is the magnitude of the building and the extent and variety of its apparatus that a discourse upon them is really a discourse upon the general topic, "The buildings and apparatus of the modern college."

If we explore the EAST WINGS OF PARDEE HALL, we shall find them full of the apparatus of manipulation. Work-rooms for the department of mechanics and physical laboratories are the main features of the first and second floors. The third and fourth floors are occupied by the department of civil engineering. They are stored with instruments for work in the field, and fitted up for industrial drawing and office-work. In another part of the building there are rooms for other kinds of drawing, and laboratories for work in botany and natural history. A separate building is devoted to the laboratories of chemistry, and another to the astronomical observatory.

All good teachers now-a-days try to have the study of books accompanied with continual exercises of practice. It is not enough for the student of mechanics to read and compute; he must put together, handle, and run real machines. The student of engineering must shoulder his instruments and use them in the field. It is little for the students of chemistry to read and remember that water is a compound of oxygen and hydrogen. Each one for himself must take the water apart and manipulate the oxygen and hydrogen with his own hands. The student of botany must pick the petals from real flowers with his own fingers. The mathematician is always doing sums. The study of language goes on to the accompaniment of tongue or pen, and grammar-work for beginners consists for the most part in preparing papers of problems illustrating the laws of speech.

The necessity for this continual manipulation is plain from the nature of language. Words are artificial signs, and do not in themselves give knowledge of objects. We are made aware of this when we hear words in a strange tongue, or fall among the sesquipedalian monsters with which our modern books of science swarm. But it is just as true of the simplest words of the mother-tongue. The child hears the words papa, water, laugh, kiss, repeated in connection with those objects and acts until the sound of the word makes it think of the object or act. The sounds convey no knowledge, but only suggest the knowledge it had before. Words are signs of complex ideas. A person to whom only a single element of an idea is known may yet use the word for it with popular correctness, and understand a little of what is meant by a sentence in which it occurs. Words and sentences are therefore what we make them to ourselves. They are nothing, or full of great meanings, according to the furnishing of our own minds. The school-boy who repeats a passage from Webster or Bacon does not necessarily repeat in his own mind the thoughts of Webster or Bacon. One of Bacon's essays has been read by a school-boy as a composition of his own. The lad did not see anything in it which he could not have written himself.

It should be further remarked of the nature of language that it lags far behind the progress of thought. The innumerable judgments on which sagacity depends are comparatively few of them ever expressed in the formal speech of artificial signs. The old furnace-man tells from the look of the bubbles that the charge of steel is becoming ready, but he has no name for that look. The engineer puts down breaks at a peculiar noise in the engine as instinctively as his eyelids close when a fly approaches, but he has no name for the noise. All processes of reasoning need signs, but original thinking and practical sagacity demand the use of primary signs in place of the secondary signs of language. The book-boy who early soars in words, the shadows of the thoughts of others, when he comes to an age to produce for himself and act for himself cannot find his proper sphere in the actual world; he fades from sight. He was more than a boy at ten; he is less than a man at thirty. Manipulation is necessary to arrest this sublimation of the mind, and to make up the short-comings of speech.

Its most general use is to keep the mind awake and alert. Lectures are apt to go in one ear and out the other. The printed page passes before the eye like a shadow. We set ourselves to think, but we brood. The current of the mind often turns a stagnant pool. The thought returns on itself and passes in smother, as Lord Bacon says. To study without pen in hand is to dream. In manipulation thought passes into act, we use our hands and eyes; we are kept busy adjusting and controlling material objects.

The manipulator stores his mind with conceptions of the senses, with information from the eyes, ears, nose, the fingertips, the muscles, and the meters of science, those magnified senses. Without these firm roots men are poor sapless things.

Manipulation trains the organs of perception and practice, the eye of Herschel, the thumb of Phidias. Chemistry, botany, mechanics, drawing, afford most effectual gymnastic of manipulation. They make a new man of the clumsiest. Precision, purity, dexterity, grace, are their gift. The flout which George Herbert transmits to us, that "the German's wit is in his fingers," might well be turned to a plaudit. Sir Gareth is a goodly figure in the Morte d'Arthure, in that he has "the fairest and largest hands that ever man saw;" and some one has characterized the Anglo-Saxons as the race with more nerves in their hands than there are in the heads of another race.

It gives clear and distinct ideas. The complex ideas of modern science to which the technical terms must guide us are the result, for the most part, of wide generalizations. They are obscure and indefinite to every man until he has often applied them to real objects. The exact meaning of the botanical terms which denote the shape of leaves—and there is nothing simpler-cannot readily be told except by actually seeing numbers of leaves. Motion in a completed curve needs to be produced and exhibited to the eye. There must also be a clear conception of every element of the object and processes. In reading or exposition we dwell on important points and neglect minor matters, which are yet essential. In manipulating, every detail must be attended to. To select the objects named in a formula, and put them in the relations named so as to produce the proper results, clears up the meaning of every term of the formula, since error is a failure.

This process of minute attention and verification strengthens the memory. Once worked out is faster in mind than ten times learned. The affections of the senses redouble the inner memory. The recurrent force of muscular and nervous habits is added. A long verbal description often in fact belongs to a movement that is comprehended in a single stroke of the eye, or other brief experience, which the memory holds without effort.

The memory is lively also as well as strong in bringing up matters which have been manipulated. The will seems to attach itself specially to them and give them something of its own activity and freedom. They spring promptly to mind when needed. The difference between just knowing a thing so that you can think it up if you are questioned and have time, and knowing it so that it will come itself without effort, clear and bright, is like the difference between drudgery and genius.

But a greater advantage of manipulation is that it trains the judgment. The reduction of theory to practice cannot be an exercise of mere memory. There is judgment in determining the real object and facts to which the theory will apply; and then there are the hundred unformulated little matters which must be decided in each particular case—problems and diffi-

culties connected with the material, its conditions, its relations to heat, friction, and other unnamed disturbances. All these compel the intelligent manipulator to extricate himself from the meshes of popular speech and the traditions of the books, and lead him to examine facts at first hand, and to be at one with the powers he uses.

And finally, the manipulator is in training to become an inventor and a discoverer. We cannot probe that vital point where the infinite and finite meet in the personality of the man of creative genius, but there are two savings about its mode of manifestation which are specially worthy of remembrance. The first is the old Greek proverb, "Genius is the daughter of memory;" the other, the hint of Newton that there is a certain style in the operations of the Divine Wisdom, in the perception of which philosophical sagacity and genius seem chiefly to consist. A mind well stored with the powers and forms of the world, which has caught the style in which these powers work and these forms combine, is likely to create according to Nature -to invent, to discover. But the manipulator has this wellstored mind, and since he continually watches the trains which real forces move in and the combinations which they actually make, it would seem that his ideas would be prone to move in accordant order, and that he, if any one, would catch the style whose last secret no one may comprehend.

These remarks suggest the usefulness of apparatus of manipulation to students of all branches of science and art, but perhaps it is most useful to those who are intending to become doctors of medicine or engineers. Every lover of the race must rejoice over any well-considered attempt to supply the means of uniting theory and practice in the education of our physicians and engineers, that they may give us more health and wealth, and kill and beggar us as little as may be. The Johns Hopkins endowment of a medical school in Baltimore, whose essential feature is a general hospital in which all the students are to have actual practice before they receive their diplomas, is the carrying out of a similar thought to that which guides the earlier study of chemistry and toxicology and physiology in our laboratories.

But it would seem that the engineers most of all demand

special, long-continued preparatory practice. The objects with which they deal are peculiar. Large numbers of persons grow up without ever having had sight of a machine of any complexity, except, perhaps, a glimpse of a locomotive, and without ever having examined the make and action of any. They cannot follow the transfer of power from wheel to wheel of the commonest machines, and in a great shop their heads clatter and buzz and their eyes swim, and it takes longer to learn to walk safely among the belts and cogs than to keep out of the way of the omnibuses in New York. But a good engineer ought to take up a shop into his consciousness as simply and completely as a shepherd does his staff or Sir Lancelot his horse and arms. The inexorable conditions of economy make it necessary that the engineer should know all working machines and their products. The costliness and perfection of existing machinery make it a primary question for every new work or tool, How can it be put together from the best and cheapest products of the old machines? The great inventors work for the most part from ideas stored in early vouth. Their materials must come to the mind without effort. haunt it in spite of effort, as do the lively impressions of youth. So young Shakespeare stored his fancy with the skies and earth and waters of Stratford; so Bunyan his, with the sloughs and meadows of Bedford. Nor was it less necessary that Newton should watch the millwheels and clocks and dials of Grantham. and that his young brain should teem with the constructions of geometry and the series of universal arithmetic. As the liveliness of youth passes away, the senses cease to store new objects, the forms of the imagination are fixed, the judgment begins to run in ruts. The morrow ceases to bring fresh woods and pastures new. It is of no use to try to work in strange beats. It would seem, then, that the best education of an engineer must include early and continual familiarity with machinery and its working.

It is said, however, that this working in laboratories, this perpetual manipulation, this study of particular facts or of second causes scattered, narrows the mind, makes men good perhaps for their own alley, but incapable of comprehensive plans or the wider views of science—that it makes the men

of whom Bacon says, "A little philosophy inclineth men's minds to atheism."

That there is some truth in this view has long been recognized by the physicians and engineers. And as these professions year by year come to the consciousness of their own importance and dignity, their more eminent members are more and more earnestly advising aspiring young men to take a course of liberal learning in addition to the courses of a professional school. But many difficulties arise. The time and cost block the way. The long interruption by a course of pure culture may be a bad break. It has been attempted here to combine the courses. The technical studies are begun at once, but they are pursued in connection with other branches, and the students are made regular members of the college classes and societies, and share in the general cultivation and learned habits and associations of college life.

But we have dwelt long enough among the laboratories. Let us pass over to the Western Wings of the Hall. Here we find the apparatus of the classificatory sciences—mineralogy, botany, natural history, geology. Room beyond room, here are marshalled cabinets and collections of minerals, plants, and animals. Here the student is to learn the uses of all natural objects, and those relations of each to all others which tell us where to find them. He learns where to look for gold, where for pyrites, and where for coal and iron; what plants grow in what places, and what animals with them; what interdependences are to be found among all the creatures. He may here learn to frame schemes of production or traffic which include the world.

We have seen that manipulation, laboratory-work, gives acuteness and penetration. Studies of classification give subtlety and comprehension. The reason is awakened to its most vigorous exercise. As it constructs the types of species and genera and compares them with natural individuals, it learns that there are real kinds in nature, and that thinking out the truth in classification is rethinking the thoughts of God. And in certain rare spirits, brooding over these collections of facts and feeling the joy of translating fact into truth, the love of

truth for its own sake arises, and once and for ever takes possession of the soul.

It is true there are persons familiar with these natural objects and groups who say that there is nothing but matter in the universe. It is plain, however, that man and other animals act upon experience and purpose. But matter has no memory nor purposes. The brain of every creature returns to dust as it was, and it cannot be told of any atom of carbon to-day whether it has gone through all the motions in the bodies of all the animals, from protoplasm to the brains of Newton, or has been lying in a coal-bed through all the ages. Experience and purpose belong to mind.

The production of organized structures is also seen to be a working upon experience. The natural series of species is like a series of inventions. Even those curious facts which most obtrude the material relations between them are first fully interpreted when referred to mind. Just as the buttons behind a gentleman's coat show that its pattern came from one who was familiar with coats on which the buttons were needed to support a sword, so rudimentary organs in natural structures show that their framer was familiar with similar structures in which the organ has use.

But they say that our senses give nothing but matter, that science knows nothing of causes, except as sensible antecedents, and that atoms of matter come to be matter *plus* mind by development.

John Stuart Mill once suggested that there might be worlds in which it should be regarded as an axiom that two and two are five. I have often pleased myself with imagining myself in such a world, putting pairs of twos together and always finding five. And I have wondered whether it would be impossible to convince the inhabitants of such a world that two and two are not five, but that two and two are four, and the fifth one is thrown in. However it might be with them, it is hard to believe that in our world any system of thinking can long prevail which uses as its first law of induction, "Two and two are five (if you give them time enough)," and which accepts the Tenterden steeple as a fundamental law of logic. On the contrary, we may still repeat with all confidence the familiar

words of the prophet of inductive science, of which we were reminded in the laboratories: "A little philosophy inclineth man's mind to atheism, but depth in philosophy bringeth men's minds about to religion; for while the mind of man looketh upon second causes scattered, it may sometimes rest in them and go no further; but when it beholdeth the chain of them confederate and linked together, it must needs fly to Providence and Deity."

We pass on to the CENTRE of the building. Here, as of right, are the library, collections of art and antiquities, lecture-rooms for history, social science and language, the society halls, and the great Auditorium. With these should be counted in other buildings, other lecture-rooms for languages, the Greek room, and all the rest; and the Reading-Room, dear to all students of Lafayette.

These may be called apparatus for the study of man and for training for the mastery of men. Here are laboratories of mind. Here are cabinets of thought. And these must always be the main part of the apparatus of education. The study of other things, of plants and animals and minerals and machines, will vary with the varying needs and fashions of each generation and each country. Man is the one object which is always the study of man.

Knowledge of men, and power to control them, are the most universally useful knowledge and power. Training in penetrating the thoughts of others, and in presenting thought so as to rule the minds of others, is the most universally useful training. Language is the chief scholastic apparatus for this training, and the study of languages in books is the natural preliminary, accompaniment, and supplement to all other studies.

The interpretation of a difficult passage in a foreign language makes the nature of this training plain. We recall or look up the general meanings of the words, and analyze them for special meanings which will fit together. We beat every bush to start every possible meaning. The judgment is summoned to detect the wrong meanings and verify the right. We apply the rules of construction. We discriminate every particle and form, and every synonym. We grasp and hold large ranges of context. We

run over and over the general train of thought. We peer into every corner for clues. We seek to examine every passage of our author, or of other authors, in which any of the words or thoughts recur. We collect and invent various readings. We resort to the library, and, if need be, to the cabinets and laboratories. We get up the whole subject-matter, the central persons and facts, and the whole environment. We scrutinize them in the light of psychology and of all science. Whatever of observation, imaginative reproduction, invention, acuteness, subtlety, and comprehension we are capable of, is called into lively exercise. This is the training most needed by the learned professions, and it is never amiss to any man. Eminent specialists who study nature and not language are often more happy in elaborating their own views than in catching the views of others. Two persons converse, and they think they understand each other, but there is nothing in which there is a greater difference between a trained and an untrained man. You spend an hour trying to expound your thought to an untrained man, and at the end he only knows, or thinks he knows, that you agree or do not agree with him; but talk half that time to an old lawyer, or priest, or professor of Greek, and he knows you better than you know yourself.

Nor is it to be forgotten, in estimating the value of the study of language or in approving methods for its study, that mastering it is of the highest value as a mastering of valuable thought. The ability to enter into the thoughts of great thinkers makes the advantage of an American over a Zulu. Books are the best tools of every workman. The youth who might of himself have nothing better to do than to watch the birds and beasts to snare or kill them, is able by means of our English language to enter into the thoughts of the great and wise of all ages.

In the history of man is also to be found material for the study of Providence. He who in the laboratories and cabinets has recognized an intelligent order in the world may here find evidence of a moral purpose, and in the later and better days in which Christianity has been the great power of history, evidence that love and justice are at one. Bibles and catechisms are a goodly part of the college apparatus.

Year by year these studies grow in proportional importance. Investigations in archæology and philology are pushing the history of man farther and farther back continually. Man is continually pushing forward. The libraries are the arsenals of the army of progress. Here are the trophies of its past victories. Here are the weapons for future conquests. We have just been having an era of inventions of labor-saving machinery, of which the most remarkable result is the improvement of means of communication. Steam-motors and telegraphs bring all men near together. We are entering, with little observation, upon a revolution of social organizations almost certain to be greater than the world has known before. Private corporations, whether for wealth or for power or friendship, stretch their arms around the world, and thousands of men distributed all over the earth are moved as easily as a corporal's guard. The irresistible power of organization is fully recognized in commercial projects. It is just as plain in politics. Out of this confused appearance of struggling corporations and associations and parties which our modern life presents, one portentous fact is emerging. Every organization must have a head, and the larger the organization the more absolute the necessity. Our largest organizations must have one headand a good one and a permanent one—for the proper running of their machinery. The present state of matters in this respect is so new that language does not yet furnish us with words to designate these persons and things with courteous recognition, but the instinct of the people has found them out, and the masses have become as familiar with bosses and rings and the machine as with anything else in our great cities. Our good people are still hoping that all these unnamables will vanish. We ought really to be training youth to be the right sort of heads of organizations; it is high time for our corporations to develop souls. Science is now embracing man within its scope and studying the laws of his action and organization. Already many important branches of social and political science are developed, and the extent of the apparatus used in investigating and illustrating them, and the number of the professors required to teach them, are so great as to call for a national university.

To a national university must also be remitted the adequate apparatus for historic study of the fine arts.

The society halls are a most important part of the apparatus of a college. Here the students unfold their thoughts to each other and sharpen their wits in friendly combats. Thus they prepare themselves for the battle of life.

And here in the Auditorium is given the opportunity for the expression of their best thoughts, in sympathy with the great masters of English speech, under the glow of public declamation, the supreme effort of the life of a college student.

What are to be the products of the college apparatus? Men, of course, but what kind of men? The scholar of the old time, the man of perfect culture, trained to all feats of mental activity, ready in all branches of knowledge, always under control, strong, alert, and graceful, the delight of all men and women,—some specimens of this kind may perhaps be produced.

The scholar of to-day, eager for progress, devoting himself to some specialty, and therein enlarging the bounds of human knowledge and power,—this apparatus might be used for him. That would be a poor college which should not number such among its children. But knowledge is now built so high that special powers as well as the devotion of a life are needed to make advances. It would be hardly right to organize the studies and direct the methods of college-work to the development of men of genius or the instruction of incipient professors in archæological learning. The great purpose must be to prepare our youth to discharge the duties of good citizens in those professions or occupations requiring special preparation—to make good preachers, lawyers, doctors, chemists, teachers, journalists, engineers, merchants, master-workmen in every good work, and heads of every good organization in Church and State.

One thing more: manhood is good in itself and everywhere. Students are, first of all, living souls. On a college campus all paths lead to the college chapel. To pray well is to study well. It has always been the pride of colleges and universities that they give their scholars a professional spirit, a

recognition of a brotherhood of scholars, who have learned to look on the possession of truth, the welfare of man and other intelligences, and the harmony of the world, as higher objects than any selfish pleasures or any private good. This character has been developed for the most part by religious teaching and by instruction in literature, the records of noble thoughts and acts which poets and orators have expressed in noble language—the grand old masters of Greece, and Rome, and Palestine, whose immortal voices echo through the corridors of time, and not less the nearer and dearer and greater masters of our own blood and language, utterers of that noble modern thought which makes noble modern men. Familiarity with these thoughts and acts, and with these inspiring forms of speech, kindles like thoughts in the minds of youth. And it must be remembered that each generation begins at the beginning in character as well as knowledge, and has to learn high ideals for itself. Machinery has material existence, and the knowledge and use of it live, but culture, nobleness, dies with each generation. A nation may lapse into moral idiocy in the midst of material greatness. A perfect course of training for professional workers, which should take them young to their own special fields, would yet not wholly engross them there, but would give them time and room for daily converse with the noble and the beautiful in history and art. and for the enjoyment and mastery of language and literature. to the end that they may become noble men as well as great powers.

The general structure of a modern college building is characteristic. It suits well with the ample gymnasium near it, and grounds prepared for athletic exercises, and rows of students' homes. The halls of the universities of Europe have been the theme of many an eloquent description. Too often they are enchanted palaces of the poets, fabrics of beauty only to the fancy—really, a hive of cells, cold, damp, dark, stifling, deadly to live in. This Pardee Hall is a fair and stately structure. Its rooms are large and lightsome. By arts unknown of yore, and at a cost that would have staggered princes, floods of fresh air warm and grateful pour up perpetually all through

it to meet the bountiful expanses of windows and fill it full of sweetness and light.

It is one of the felicities of architecture that its works are adopted by Nature. This beautiful hall is henceforth of one family with the hills around us; not naked and alone, but robed and garlanded with these green slopes, this glorious sky, and all the wondrous beauties of earth in the midst of which it stands.

And it is a still higher felicity that it may receive a consecration, a light that never was on sea or land, from association with high thoughts and noble deeds. One such association is alive to-day in all our thoughts, and will live as long as these walls stand. It is put on record for all the generations of Lafayette in the following action of the Faculty:

WHEREAS, It has been held seemly to honor intelligent munificence, and for Christian scholars to tenderly preserve the memory of promoters of science and learning, and for learned foundations to have set times to honor their founder and cherish his grateful remembrance; and

Whereas, The celebration of such deeds of munificence is a powerful means of inciting youth to imitate them, and of training them up to all those liberal acts and thoughts which are the fruit of the highest culture; therefore—

Resolved, That to-morrow, the 21st day of October, being the first anniversary of the formal opening and dedication of Pardee Hall, the usual lectures and recitations be suspended, and the day marked by appropriate exercises; and that hereafter the Wednesday following the 21st day of October in each year be recognized as the anniversary of the founding and gift of Pardee Hall, and that it be set apart forever by Lafayette College, its Faculty and students, under the name of Founder's Day, as a day of commemoration of the founder, Ario Pardee.

APPENDIX.

THE following Report of the Exercises at the Re-opening of Pardee Hall, Tuesday, November 30, 1880, is taken from the December Number of the Lafayette College Journal:

Tuesday, November 30, 1880, will ever be a red-letter day in the calendar of Lafayette. It was a joyous occasion in itself, and the general rejoicing was to many blended with grateful recollections of October 21, 1873, when the first Hall was dedicated amid one of the greatest outpourings of the people that Easton had ever witnessed, and probably the largest assemblage of the Alumni and friends of the College from abroad that had ever been known. These rejoicings were heightened, too, by the recollection of that sad night in June of last year when the multitudes looked in silent grief upon the devouring flames that left Pardee Hall a mass of blackened ruins, and doubted whether the noble building, which was the pride of the College and of the town, would ever be restored. And now that the stately edifice had so speedily risen from its ashes in the same beautiful proportions, and even rendered more complete by many improvements in the reconstruction, the citizens of Easton and the Alumni and friends of the College felt the thrill of a more exuberant joy even than at the first dedication.

And never was there a happier combination of all that could make a November morning bright and cheery. Providence seemed to smile upon the day. Tuesday came between two days of storm, upon either of which it would have been impossible to carry out the programme which had been arranged. The snow-storm of Monday had robed the hills and valleys in white, adding rare beauty to the marvellous view from College Hill, which always awakens the enthusiasm of every beholder.

The streets of Easton were early astir with crowds of men, women, and children. Over night the town had been filled with strangers, and the early trains were crowded with visitors, who thronged the streets, and, climbing College Hill, passed the morning hours in visiting the various College buildings or in enjoying the magnificent landscape spread out before the beholder on the brow of the hill, and which has been so well described by the graceful pen of Ik Marvel.

At 10.45 the President of the United States and his distinguished party arrived in a special car from Washington. An immense concourse of people had assembled at the Phillipsburg dépôt and in the large open square adjoining, who greeted with loud and enthusiastic cheers the arrival of the train. Besides President Haves, there were in the car from Washington his son, Mr. R. P. Hayes; Hon. Alexander Ramsey, Secretary of War; Hon. Horace Maynard, Postmaster-General; Gen. W. T. Sherman; Hon. A. D. Hazen, Assistant Postmaster-General; Hon. John Jameson, Superintendent of Railway Mail Service; Hon. John Eaton, United States Commissioner of Education and President Gilman of Johns Hopkins University. The distinguished guests were briefly and informally welcomed by the Governor of Pennsylvania and the President of the College, with a Committee of eminent citizens of both political parties who had united to show respect to the chief Executive of the nation. The Committee consisted of the Hon. Henry Green, of the Supreme Court of Pennsylvania, a graduate of Lafayette, Class of 1846; Hon. O. H. Mevers, Class of 1847, President Judge of the Northampton County Court; James K. Dawes, Class of 1862, President of the School Board of Easton; E. J. Fox, Esq.; E. E. Hemingway, President of the Borough Council; Gen. Frank Reeder; Hon. William Beidelman, State Senator elect; and the Hon. William Mutchler, Member of Congress elect.

The Presidential party, with the Committee of citizens, was soon seated in open carriages, and passed through the bridge and up Northampton street, which was thronged with a vast multitude, the houses on both sides being profusely and tastefully decorated with the national colors.

It was the first time within the memory of the present generation that a President of the United States had visited Easton. Some of the older citizens recalled the visit of Martin Van Buren, who passed through Easton in 1839 on his way from Harrisburg to New York. But President Hayes had come from Washington for the express purpose of making this visit, and as he came with no political, nor even any private or personal, object in view, but to honor the dedication of the great Hall which is, as we have before observed, the pride of the Borough as well as of the College, all parties joined to show him respect, and amid loud huzzas and the ringing of the church-bells the cortège wended its way slowly through the surging crowd. A pleasing feature of the day was the gathering of the children of the public schools upon Third street,

under the direction of their teachers and Superintendent Cottingham. President Hayes arose in his carriage and remained standing until the carriage had passed the long line of nearly two thousand children, bowing repeatedly as the cheers went up from the great throng. The view from College Hill, looking down Third street, reminded the beholder of the grand procession, gay with flags and banners, that seven years ago filled Third street, and reached half a mile beyond, on its way to the dedication services of the first Hall.

Arriving at the brow of the hill at the entrance of the College grounds, the carriages passed through the ranks of the students, who were there marshalled under their own officers. The President bowed and received from the students loud cheers, ending with the famous tiger LA-FA-YETTE! which he heard then for the first time. The ranks of the students were then closed in solid column, and, marching at the head of the carriages, they escorted the party to the northern entrance of the Chapel, where the procession had already been marshalled by Prof. Youngman in the following order:

The College Band.

The escort, consisting of the officers of the Senior Class, officers of the Junior Class, officers of the Sophomore Class, officers of the Freshmen Class.

The President of the College and the Orator of the Day, with the President of the Trustees and Mr. Pardee.

The President of the United States and the Governor of Pennsylvania; the Secretary of War and the Postmaster-General; the Assistant Postmaster-General and the President of the Alumni Association; the United States Commissioner of Education and the Superintendent of Public Instruction in Pennsylvania; the Moderator of the General Assembly and the Moderator of the Synod of Philadelphia.

The Trustees of the College, with representatives from the Trustees of other Colleges.

The Faculty of the College, with representatives from the Faculties of other Colleges.

The Board of Examiners of the Pardee Scientific Department, with the Alumni Committee of Examiners.

The Alumni in order of graduation.

The President and Members of the Easton School Board, with the President and Members of the Borough Council.

The Clergy.

Other learned professions, including the Press.

Citizens of Easton and visitors.

Undergraduates in the order of classes.

Alighting from their carriages, the distinguished visitors took the places assigned them, and the procession immediately moved on to the Hall, where it was halted and massed upon the terraces surrounding the broad platform at the main entrance. President Cattell, advancing to the edge of the broad flight of stone steps, said:

Seven years ago, upon this very spot, Mr. Pardee placed in my hands the keys of the noble building which he had erected for the benefit of the young men of the country. You know its subsequent history. You know that it was destroyed by fire in June of last year; that it has been rebuilt according to the original plans, except where experience in the use of the building suggested improvements; and that to-day we have come here to dedicate it. I have endeavored to get Mr. Pardee to make a speech on the occasion, but the fact is that I find it easier to get him to give now and then a hundred thousand dollars to the College than to persuade him to make an address; but I wish to state in this public manner that not a dollar has been expended in the reconstruction of the Hall except that which has been furnished by Mr. Pardee. (Applause.) As Mr. Pardee begs to be excused from speaking, I have the honor of introducing to you an old student at Lafayette College, Hon. Henry M. Hoyt, the Governor of this Commonwealth.

Governor Hoyt was loudly cheered as he appeared in front of the platform. In the course of a brief speech, intended to introduce President Hayes to the crowd, he humorously referred to "the delightful kind of adversity, the chastening kind of prosperity, with which Lafayette College had lately been visited. The people of the neighborhood, the presidents and professors of other colleges, and the magnates of the nation, were present, and it was good to gather under this bright façade to congratulate and bless Ario Pardee." (Cheers.) Governor Hoyt then introduced Mr. Hayes, saying that the President had borne testimony to that strength and beauty which education lends to the American nation.

President Hayes stepped forward to the edge of the broad steps, and, baring his head in the bright sunlight, responded to the applause of the delighted assemblage with several stately bows. When the cheering had subsided, the President, in a clear, strong, ringing voice, that easily carried his words to those on the outskirts of the gathering, spoke as follows: (For the report of the President's speech, and of several that follow, we are indebted to the account of the proceedings which appeared in the New York *Tribune* of the next day.—Eds. Journal.)

MR. PRESIDENT, GOVERNOR HOYT, LADIES AND GENTLEMEN: In our country and in every republic it is the business of the Government to educate its citizens in the duty of citizenship; indeed the Government of this country is in the citizen, and it will be a good government just in proportion as the citizens have good education. (Applause.) The best government under a republic will be that with the best education. Ignorant voters

are powder and ball for the demagogue. Therefore it is that from the beginning Washington and Jefferson and the Fathers all urged upon the people on every suitable occasion the importance of popular education.

But there is something beyond this—beyond that which is necessary merely to make good citizens. There is that higher education which can be furnished only by the college, the university, the scientific school; and those institutions our Government does not in any large degree aid. The exceptional cases are West Point and the Naval Academy: but for the rest. for that higher education, which every people must have that is to be really great and renowned, we must look to the benefaction and voluntary contribution of the wealthy citizens. They, fortunately, have the wisdom and generosity to found institutions like these. Wealthy men understand that in no way can they do such good to those who are to come after them-in no way can they build to themselves such a monument that will preserve gratefully their memories in future generations—as by endowing a college, a university, a scientific school. (Applause.) Therefore, my friends, we are here on this occasion to do honor to the man who has set an example. (Applause.) And what an example it is! He has not waited for the time of his last will and testament, and the uncertainties which my friends the lawyers here perfectly understand. (Laughter.) He does it while he is alive and can see that his wishes are properly carried out and the work well done. Let us then say that you and I, and all of us, are spending our time well to-day in contributing something to honor this example, which, we hope, is often again and again to be followed in our country hereafter. (Applause.) I thank the President and those connected with the institution for their kindness in inviting me to be present. I am glad to be here. glad to join with you in saying "God bless Mr. Pardee!" (Loud applause.)

The concluding words of President Hayes's address led to loud calls for Mr. Pardee, and Dr. Cattell with some trouble found him in the crowd behind the Presidential party, and brought him forward, Mr. Pardee saying to him, "You have brought me out, but very little you will make of me." The appearance of this great benefactor of the College was of course the signal for prolonged cheering, but Mr. Pardee, after bowing his acknowledgments, only said:

I rejoice with you that we can again look upon this building completely restored, and even improved for its work; but Dr. Cattell is wrong in saying that it is my money that rebuilt it. It was through the wise forethought of the Trustees, in keeping up an ample insurance, that we have to-day the Hall restored to the College.

As Mr. Pardee retired amid the renewed cheers of the great assembly, Dr. Cattell hastened forward to explain:

The citizens of Easton had contributed liberally to the equipment of the building, and so had some other friends of the College, but for the reconstruction of the building itself not one dollar had been received from any other person than Mr. Pardee. It was upon the original Hall, built and

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equipped by him for the College at a cost of \$300,000, that this ample insurance had been made. The Hall as it stands to-day is, therefore, equally with the original building, his gift to the College. (Prolonged cheering.)

As he concluded there were loud crics for "Sherman;" and General Sherman came forward as if to speak, but, to the great disappointment of the gathering, merely bowed and retired.

Secretary Ramsey was next introduced as one of the old Lafayette students. "I am not so old as you think I am," he jocularly remarked, and amid the hearty laughter this evoked made way for Postmaster-General Maynard, who, after being formally introduced, made a short but effective address. Hon. A. D. Hazen (Class of 1863), Assistant Postmaster-General, was loudly called for, but did not appear.

The procession was then re-formed by Professor Youngman, and mounting the stone steps entered the Hall. Soon every seat in the great auditorium was filled, every inch even of standing-room upon the ground floor was occupied. The galleries, which had been reserved for the ladies and their escorts, were of course crowded to their utmost capacity. Those who had entered the new building for the first time, and who remembered the magnificent auditorium of the old Hall, looked eagerly around, but a glance assured them that the new was in no respect inferior to the old: in some things—notably in the frescoing and in the movable cushioned seats—there was a great improvement, and everybody pronounced it a great success.

After the audience had become quiet the prayer of dedication was offered by Rev. William M. Paxton, D. D., of New York City, Moderator of the General Assembly of the Presbyterian Church.

President Cattell then introduced the Orator of the Day, Francis A. March, LL.D., Professor of the English Language and of Comparative Philology in the College. He said:

During the fall term of my first year at Lafayette as Professor of Ancient Languages—this was in 1855—the Faculty found it necessary to ask the Trustees for an additional teacher. We had heard of a young scholar of great promise, a native of Massachusetts, but then residing in Fredericksburg, Va., and we persuaded the Executive Committee to appoint him Tutor in Ancient Languages. He entered at once upon his duties —at a salary, I believe, of \$400—and heard the Freshmen recite in one of the old basement rooms of the College, then known as "the Tombs." I always claim to have been the first to find out that the Tutor knew more Latin and Greek than the Professor. (Laughter.) Others soon found it out too--my claim is only that of being the original discoverer (renewed merriment); and I said to the Trustees that if we both continued in the de-

partment of Ancient Languages our places should be reversed. But the situation was relieved after a year or two by promoting the young Tutor to a department of his own—one that placed the English language, as a college study, upon the same footing as the ancient languages. This was a new departure, not only for Lafayette, but for any American college. Of course our mother tongue had been studied here and in other colleges, but it was more as a part of Rhetoric, Belles-lettres, etc. than as a language, and we claim the honor of being the first college to erect the English language into a department of its own, uniting with its study that of Comparative Philology. This, I need scarcely add, is now done in most colleges of high rank. (Applause.)

This is not the time nor the place for me to speak of the most friendly and intimate relations that have, without interruption, existed between my colleague and myself as both of us have steadily grown older during this quarter of a century; but I may say here, what all scholars know, that he has come to be a recognized authority in Philology even in the oldest universities of Europe, and that his great learning reflects honor, not only upon this College and upon this country, but upon the age in which we live. (Applause.)

It is this great scholar, Dr. Francis A. March, who will now address you.

The readers of the *Journal* need not be told of the enthusiasm awakened in the audience as the honored Professor advanced to the front of the platform and laid his manuscript upon the reading-desk. It was long before the applause subsided and he could commence his address, which he read in a clear, distinct voice, plainly heard by every one in the great Hall, the stillness of the vast audience being broken only by the applause which greeted many passages and the prolonged cheering at the close of the address.

At the conclusion of Professor March's address (which is given in full in the preceding pages), President Cattell read telegrams from the Hon. William A. Wallace and the Hon. J. Donald Cameron, United States Senators from Pennsylvania, and from Governor George B. McClellan of New Jersey, regretting their inability to be present. A round of applause greeted the reading of a telegram in Latin from Rev. Dr. McCook of Philadelphia, addressed to "President Cattell and his boys." Dr. McCook's interesting and instructive lectures upon Darwinism were among the last public exercises held in the old Auditorium. Dr. Cattell also referred to the Fair held by the ladies of Easton, in November last, in aid of the equipment of the building, and said that the amount realized, about twenty-six hundred dollars, had been appropriated toward the furnishing of the beautiful room in which they were assembled. The benediction was then pronounced by the Rev.

Wallace Radcliffe of Reading, Moderator of the Synod of Philadelphia.

An opportunity was then afforded, for all who so desired, to be introduced to President Hayes, the arrangements being under the direction of the Committee of Citizens.

Promptly at two o'clock were thrown open the doors of the Geological Hall, occupying the fourth and the fifth stories of the central building, and of the large drawing-rooms of the Civil and Mining Engineers in the east and west lateral wings, communicating with the Geological Hall. These spacious rooms had been tastefully decorated by the ladies of Easton, and tables were spread for over five hundred guests. The readers of the *Journal*, who are familiar with the Lafayette Commencement dinners, need no word of ours to be assured of the elegant and abundant provision that was made, nor of the grace and beauty of the fair ladies who did the honors of the occasion.

At the table at the south end of the room were seated at the right of President Cattell the President of the United States, at his lest the Governor of Pennsylvania. The other places were occupied by Mr. Pardee; Secretary Ramsey; Postmaster-General Maynard; General Sherman; Major-General Robert Patterson, President of the Board of Trustees; Hon. John Eaton, LL.D., United States Commissioner of Education; Hon. James P. Wickersham, LL.D., Superintendent of Public Instruction in Pennsylvania; Traill Green, M. D., LL.D., Dean of the Pardee Scientific Department and the venerable David Thomas of the Board of Examiners in the same; Hon. H. G. Fisher, President of the Alumni Association; W. A. M. Grier, Esq. (Class of 1856); and E. J. Fox, Esq., of the Citizens' Committee. On the opposite side of the table sat Dr. Paxton, Moderator of the General Assembly; Rev. Wallace Radcliffe, Moderator of the Synod of Philadelphia; William Henry Green, D. D., LL.D., of Princeton Theological Seminary; Charles A. Dickey, D. D., Chairman of the Committee of the Philadelphia Ministerial Association; S. C. Logan, D. D., of the Committee of Synod; President Gilman, LL.D., of Johns Hopkins University; President Lamberton, LL.D., of the Lehigh University; Hon. William E. Dodge of New York; Hon. John I. Blair of New Jersey; ex-Senator Cattell of New Jersey; Hon. A. D. Hazen, Assistant Postmaster-General; and Mr. Hayes, son of the President. Near these were grouped some of the Trustees of the College: C. D. Wood, Esq., of New York City, Chairman of the Finance Committee; Rev. J. H. M. Knox, D D.,

Hon. Thomas Dickson, Judge Alfred Hand, Mr. T. L. McKeen, Mr. James W. Long, Rev. S. T. Lowrie, D. D., and Rev. N. S. McFetridge; while at the other tables throughout the three rooms were seated many scholars and eminent men in Church and State. It is safe to say that there has rarely been gathered at a literary festival in any American college such a distinguished company.

The divine blessing was asked by the Rev. J. W. Wood, D. D., the oldest ministerial graduate of the College now living.

After ample justice had been done to the elegant provision by the guests, who were gracefully served by the ladies, the whole company arose and sung the long metre Doxology. Those who had occupied the tables in the east and west wings crowded into the main hall, filling every available inch of standing room. The galleries had been reserved for the ladies of the Dinner Association and their friends.

Dr. Cattell then introduced President Hayes in the following words:

In introducing to you the President of the United States, I beg to express to him for his presence at these exercises the thanks, not only of the friends of this College, but of all friends of education and all lovers of our country, for in paying this tribute of respect to the cause of the higher education, the President has given another proof that he has at heart the interests of the country. I beg also to add that it is well for all college students and young men throughout the land, and for the country whose future is so closely bound up with theirs, that we have a Chief Magistrate of the nation who adorns his high place by wise statesmanship and scholarly abilities, and—what is more and better—by a character so pure that the young men of our country may well take it as a model upon which to form their own.

President Hayes upon rising was greeted with loud cheers. He said:

If on any occasion I could depart from the rule which I laid down for myself long ago, it would be on this occasion. I am greatly gratified by your kindness, and have enjoyed the visit very much. But long ago I thought it would be best not to make speeches after dinner (laughter); and so, my friends, I wish you to consider that I have said all that it would be fitting and suitable for me to say on this occasion. Following the example of my predecessor in the Presidential office, I will say, therefore, that it gives me great pleasure to yield the rest of my time to a former student of your College, Secretary Ramsey. (Applause.)

As Secretary Ramsey arose he was received with prolonged applause, which, as he proceeded in an easy and genial way with reminiscences of his life at Lafayette, was frequently renewed, the old students of the College embracing the opportunity to testify their admiration of their former companion, whose career as Gov-

ernor, Senator, and Cabinet officer had been so brilliant. He spoke as follows:

I can understand very well that on an ordinary occasion the President of the United States might well decline to make an after-dinner speech, because on ordinary occasions there is generally a good deal of wine circulating (laughter); but here we have been drinking pure water and tea and coffee, and I really cannot see, therefore, why my friend is afraid to make a speech. (Renewed laughter.) At a dinner where the wine flows in abundance it might be a little indiscreet for a man to make a speech, and no doubt the President has adopted this rule because of his past experience in that regard. (Laughter.) I respect the President for the habit he has acquired; but having taken nothing but a cup of tea on the present occasion, I feel none of his reluctance.

The President was kind enough to say that I was a former student of this college. How long ago you do not want to know. If I should tell you, you would not believe it. I appeal to the ladies whether a man as fresh and hearty-looking as I am could have been a student here in 1834. (Laughter.) But we are here to-day to inaugurate this grand Hall—one which every man.in the country, and especially Pennsylvanians, will be proud of—the munificent gift of one great public benefactor. (Applause.) The world everywhere may be proud of such a man. One who has done so much for his country, for his community, and for his friends is entitled to the favorable consideration of the whole country. (Applause.) I have no doubt, my friends, you esteem him in that regard. Surely, he is richly entitled to it.

This ancient institution of Lafayette College had not this noble building when I was here in '34. And that reminds me of a statement made to me by a member of the Senate of the United States, who accompanied the remains of Charles Sumner to Boston. When we passed by the magnificent buildings which constitute Harvard College, he said, "What are those buildings?"—"Harvard College," was the reply.—"All those buildings?"— "Yes."—"Why," said he, "I graduated at Centre College, Kentucky, and there were only four rooms in the whole college!" This shows the changes that have come round in the years passed. No man who was here when I was, and saw the rustic character of this institution and its surroundings, could ever have anticipated, in the remotest degree, the magnificent condition in which you are now. At that time, when I stood upon this bleak and naked hill, the population of all these United States was only fifteen or sixteen millions, and the population of New York was but 250,000. Then we had no telegraph, and the first railroad was but started in that year. At that time no President of the United States had ever crossed the Mississippi River, and now, within three months, I have seen a President of the United States bathe in the broad waters of the Pacific Ocean. (Laughter.) That makes it for ever and ever an American sea. (Renewed merriment.) Everything has wonderfully grown since 1834, and by the diffusion of education the people have been largely benefited, and therein have been able directly to help forward this cause.

The Secretary continued for some time in the same happy vein, paying a high compliment to the State of Minnesota, which, he said, "has wonder-

fully developed in population and resources, within the last few years. When I first went there the whole population of the Territory, exclusive of Indians, was not four thousand. At the last election the State cast not far from 100,000 votes. Let me advise the young men here who are looking toward the West to settle in the great and growing Commonwealth of Minnesota, where, however low the temperature without may be, our homes and hearts are always warm. (Great applause.)

Dr. Cattell then made another ineffectual attempt to get a speech from Mr. Pardee. Great cheering of course followed the mention of his name, but Mr. Pardee only said that it was useless for him at this late day to assume the character of a public speaker. Providence had denied to him this gift; and, thanking the audience for their courtesy, he sat down amid renewed applause.

Governor Hoyt was the next speaker. In introducing him President Cattell said that "of all the distinguished occupants of the Governor's chair in Pennsylvania, no one was more in place in such a company of scholars and statesmen than Governor Hoyt. He nobly represented 'the scholar in politics.'" The Governor was loudly cheered, and began his speech by some pleasant reminiscences of the three years he had spent at Lafayette. He further said:

"The foundation of the greatness of this College was laid fifty years ago in the obscure labors and loving toil of its first President, Dr. George Junkin; and God spared the patriarch to a good old age that he might see, at least in part, the fulfilment of his heart-cherished hopes for the College. Every stone of the plain but substantial building that crowned the hill, and which for so many years was the only college edifice, was laid in the prayers of the good doctor." He then gave a humorous account of the circumstances that led to his leaving Lafayette at the close of his Junior year, and added: "This, in some respects, has been a lifelong disadvantage. For example, I lost the differential calculus! (Laughter.) That was a Senior study at Lafayette and a Junior study at Williams, and between the two colleges I missed it in early life, and ever since have been trying in vain to catch up with its inestimable beauties and treasures. (Renewed merriment.) But there was one thing I found at both colleges, and that was the Shorter Catechism. Dr. Junkin drilled us in it; so did Dr. Hopkins. If anybody here wants to ask me any of the one hundred and seven questions, I am ready to give him the answer. I don't live up to the Catechism perhaps as well as I ought, but it is one of the things I claim to know."

He then paid a glowing tribute to the educational institutions of Pennsylvania, and resumed his seat amid great applause.

The Hon. Horace Maynard, Postmaster-General, was then introduced. Dr. Cattell referred to Mr. Maynard having been a Lay Delegate to the recent Presbyterian Council in Philadelphia, and

said the distinguished career of such men shows that manly Christian life can be maintained in high political station. Mr. Maynard replied in an eloquent speech. Among other things, he said:

"I should not occupy your time but for a single suggestion that I have to make to these young men, who, in life's early morning, are looking forward to a future bright and full of hope. The suggestion is this: Do not allow the means of education to deceive you into thinking that it is education itself. I remember an interview, during the war, that several of us had with the late President Lincoln. The gentlemen present were high in the confidence of the country and of the President. One point of the discussion was that instead of letting our army be misled by those martinet officers from West Point, we should go out into the country and pick up men who had a genius for war, men to whom war comes as an instinct. Mr. Lincoln listened patiently, and replied, 'Well, I never knew much about West Point, and I suppose that the general notion out in our Western country, that we should get along just as well without such knowledge, is pretty correct. I believe that West Point never gave a man brains if his Maker hadn't given him any. Still, a man must know more about a business he had adopted and devoted his life to than the man who has not.' Just in the same way in regard to education. It is not the apparatus, the means, the appliances; it is the mind, the intellect. Take any learned profession, and see with what comparatively humble and ineffective instruments they had to work half or three quarters of a century ago, yet many became great scholars and great men." He then paid a glowing tribute to Marshall, Kent, and Story, the three great luminaries in American Jurisprudence. Other names illustrious in Theology and Medicine might be named, and these were men who had not such advantages as were now afforded at Lafayette and other colleges. But they achieved success. "You, young men, must depend upon yourselves. Appliances of education are great helps, but all the paraphernalia of the schools will not alone make scholars. You must, in an important sense, educate yourselves."

The "great soldier" was then introduced, and General Sherman rose to his feet amid a perfect storm of applause. The greeting the general received from the scholars and divines around him could not have been heartier had he risen in the midst of his old comrades in "the March to the Sea;" even the ladies joined in the demonstration, for the frank, cheery, courteous manner of the general seemed to have taken their hearts also. He commenced by saying:

I am always astonished when I find myself among learned men—Professors in colleges, Senators and Governors, and great men—that they should turn to me, a plain, blunt soldier, to speak. I do not profess to know anything about what you call learning, but I bear the highest honor to the labors of men such as Professor March, who ranks among the first philologists of the world, and to the institution he so nobly represents. Still more

do I honor him who gave of his portion freely to erect this Hall, which is a gift of love and reverence for education and for the spread of knowledge among men. (Applause.) He has received to-day stronger thanks than words, for he can see in every face how much his act is honored and appreciated. (Applause.) His name will ever stand as a monument on the banks of the Delaware, to be honored for all time. He then referred to the historical associations of this beautiful valley, speaking of the many battles with the Indians which had taken place near the spot. He concluded with an exhortation to the young men to make the best of their advantages, and said that they, the elders, had entered the threshold of life, and were preparing the way for greater things than could now be conceived, but which would be for the enjoyment of the coming generation. "Franklin was sent here as a soldier, and," said he, "I love to think of the great statesman as a soldier. He succeeded in that, as he did in whatever else he undertook. Any man with good muscle and brains, who is in earnest, can become a great general if called to the field; but education fits him for his profession, as it does the lawyer and the doctor for theirs.

"This great assembly, in which there are so many young men, is an interesting sight to me. You young men are to be held to an account for the world's progress. We older men have but prepared the way for greater possibilities. The world is going on for the better, but it is not yet half done, or a quarter done. You must study well; read, and digest what you read; love your country; then apply all your energies and resources to the part you act, and God will take care of the rest." (Great cheering.)

The Hon. William E. Dodge was then introduced by Dr. Cattell as one of the great benefactors, not only of Lafayette College, but of many other institutions of learning; indeed, there was scarcely an organization for doing good into which he had not put his heart and his purse. His great philanthropy was only one trait of a rare Christian character.

Mr. Dodge responded in his usual felicitous manner. Secretary Ramsev had referred to the old times, but the speaker lived in New York when its population was only 175,000, and when there was no Chicago. In the wonderful growth of our country, institutions of learning like Lafayette had also grown. It was scarcely fifty years since its Charter was obtained, and graduates of its first class are still living, yet see to what proportions it has attained! Young men had greater advantages now than they had when he was a boy, and they have therefore greater responsibilities. He and Mr. Pardee had walked, arm-in-arm, this morning through the spacious rooms and corridors of this noble edifice, and when Mr. Pardee told him that he could not make a speech, he replied that his actions spoke for him, and they spoke louder than words. He paid a handsome compliment to the young ladies who, with such grace and kindness, had waited upon the guests. (Great applause.)

Dr. Cattell then stated that when he entered upon the duties of the Presidency in 1864, he found among the papers in the College archives a subscription-book dated more than forty years ago. Among the subscriptions was one for two dollars, marked, with decided strokes of the pen, PAID. Following up the clue, he found that the subscriber, a young man then just entering business, had prospered—and he "interviewed" him. "The result was," added the doctor, "that I have a subscription-book in which the same name appears opposite the sum of seventeen thousand dollars (applause), and this too is marked PAID. (Renewed applause.) This same gentleman has endowed a Professorship at Princeton Collegethe first endowment of a Chair, I believe, in that noble institution, the mother of Presbyterian colleges. He has done a still more munificent act by founding Blair Hall, an academy of high rank, at the place of his residence, which he has endowed and transferred to the Presbytery of Newton. Such a benefactor to the cause of Education deserves high honor on a day like this, and I have the pleasure of introducing to you the Hon. John I. Blair of New Iersey." (Great applause.)

Mr. Blair replied in a humorous vein, and was frequently interrupted by applause. He said it was easy to be seen that he was no "graduate." Like his friends, Mr. Pardee and Mr. Dodge, he did not have much advantage in the way of early education, but, like them, he was anxious that the young men of the present day should enjoy these advantages, and he was glad that he had been able to do something toward putting education within their reach. "When a boy," added he with a merry twinkle in his eye, "I did study a little arithmetic, and in my subsequent life have done pretty well in 'addition.' Dr. Cattell and some other college-men took me in hand, later in life, and gave me some lessons in 'subtraction.'" (Great merriment.) He warmly eulogized Mr. Pardee for his benefaction, and said he would be remembered and honored as long as water runs and grass grows green. Referring to the growing needs of such institutions as Lafayette College, he proposed to be one of five to endow the Presidency in the sum of fifty thousand dollars.* (Great cheering.)

^{*} The following extract from a letter received by President Cattell from the Rev. Dr. Ballard, as these pages were going through the press, will be read in this connection with peculiar interest, and Mr. Blair will receive the grateful thanks of all friends of education for this munificent addition to his former gifts to this cause:

[&]quot;I am happy to announce to you that, after an interview had yesterday with

Dr. Cattell said that having now heard from these distinguished guests, he would propose as a toast "ALMA MATER." and in response would call upon representatives from the Alumni, from the Faculty, and from the Trustees.

Hon. H. G. Fisher, President of the Alumni Association and Member of Congress from Pennsylvania, was the first to respond to this toast, which he did in what the New York *Tribune* fittingly describes as "a graceful address." He paid a handsome tribute to the learning and ability of his predecessor in the Presidency of the Association, N. B. Smithers, LL.D., late Member of Congress from Delaware, and *Alma Mater* has indeed reason to be proud when represented in the national legislature by such men as Mr. Fisher and Dr. Smithers.

Traill Green, M. D., LL.D., the Dean of the Pardee Scientific Department, and, as Dr. Cattell called him, the Nestor of the Faculty, having been connected with the College almost from its organization, responded for the Faculty in a fitting though brief speech. "The ancient people of God," said he, "at the dedication of the second temple wept as they remembered the glory of the old, which overshadowed that of the new. We rejoice to-day over a new building in no respect inferior to the old, and in many respects a great improvement even upon the noble building we had before."

R. W. Raymond, Ph. D., the orator of the day at the first dedication, also responded for the Faculty, and his witty speech was greeted by round after round of applause. He said:

MR. PRESIDENT, LADIES, AND GENTLEMEN: I might well be somewhat surprised at the recklessness involved in calling again in this place upon the ill-omened orator whose inflammatory speech of seven years ago scattered in this stately edifice the unsuspected seeds of conflagration. (Laughter.) I thought the wisdom which had selected for the orator of to-day my staid and learned colleague might well evince itself still further by omitting from the programme altogether the incendiary of 1873. Indeed, I had no desire to have that performance recalled. I would rather remain in friendly oblivion than pass into history as the sole companion of that famous wretch who fired the Ephesian dome. (Laughter.)

But I must confess that as I listened to the address of Prof. March, profound and learned as it was, I felt a fresh alarm for the college, for I was conscious that something burned within me. I fear that you, sir, too hastily forgot how beneath the calmness of the mature philosopher may live the

Mr. Blair, he generously enlarged his offer made on the day of the re-opening of Pardee Hall, and placed in my hands a written guarantee endowing the President's Chair in the sum of \$40,000; the bonds of that amount to be fully secured, bearing interest at 7 per cent., payable semi-annually, to be delivered to the Trustees of the College in April next." . . .

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heat of a noble enthusiasm, nourishing the flame of an immortal youth—how thoughts that burn may flash from lips that seem to promise cold, sage counsel only, as through the lens of ice the rays of heat may be transmitted with intense, concentrated force. (Applause.) In a word, sir, I warn you, with the authority of an expert in conflagrations, that Prof. March's address is every whit as dangerous as mine was; and I advise you to keep the building fully insured. (Great merriment.)

The place where we are gathered has its associations of a different kind. This was the chemical store-room. If at any former time we had undertaken to gather and eat and drink the contents of the jars and dishes that were then as now displayed in rich abundance here, the result of the convivial assemblage would have been fearful to contemplate. It is in one of Marryat's forgotten novels, I believe, that half a dozen couples are carried safely through the misunderstandings and adventures of true love, paired off at last and made ready for the final ceremony of marriage, to when, on the morning of the day which is to make twelve hearts beat as six, the cook poisons the broth, and the curtain falls on all the dramatis persona laid out in a row! (Laughter.) Similar would have been the climax of a symposium in this place a few months ago. But there came the day of awful cooking, when acid met alkali in death-encounter, and atomicities ran riot like naked imps seeking for victims, while over all a cloud of thermal units hovered like emancipated Afrites, to complete the destruction of the limbo where they had been imprisoned. Then all the principles and operations of chemistry broke loose at once. What had been patiently taught for years, piecemeal, beneath this roof-solution, precipitation, sublimation, reaction, dissociation, ignition, fusion-found one grand experimental illustration. (Great merriment.)

Science having thus demonstrated its power—once for all, let us hope—and made, on the whole, rather "a mess" of its cookery, the ladies have taken the matter in hand; and we have no reason on this occasion to regret their supremacy. What a wonderful power has woman if she were not too kind to wield it selfishly! Even in this presence, looking as it were the government of their country in the face, the ladies of Easton might say, "We care not who makes the laws of a country, while we prepare its dishes." (Applause.) A bit of underdone heavy pastry, a trifle too much of saleratus, a muddy cup of coffee to-day, and who could have answered for the result? A dyspeptic Cabinet meeting revenging itself upon the Indians, the Chinese, the Solid South, Wall street, foreign nations, and the postmaster of Easton! (Laughter.) But, on the other hand, what blessings may we not expect from this excellently prepared and well-digested meal! Even that dream of poets, civil-service reform,-may it not start from the more than civil service of these fair hands, and, extending to hotels and railroads. find its way at last into politics? (Great applause.)

A single word more. This place has prophecies as well as memories. It is destined to be the geological museum. That it is not so to-day is due to the absence of fossils. But they will come in time, and I may be permitted to hope, sir, that in those distant days when you and I shall deserve that enviable distinction, we may be blest with as fair and friendly a resting-place as this. (Long-continued applause.)

President Cattell then referred to the presence of many distinguished representatives from other colleges and universities, and to the many letters received from their Faculties bearing congratulations and hearty good wishes. To respond for these sister institutions of learning he called first upon the eminent President of Johns Hopkins University, D. C. Gilman, LL.D., of Baltimore, who was loudly cheered. He said:

MR. PRESIDENT, LADIES, AND GENTLEMEN: I am sure that the graduates of many American colleges rejoice to-day with Lafayette. They are glad that this thriving institution has such a President as Dr. Cattell; such a benefactor as Mr. Pardee; such a professor as the Orator of the Day (Dr. F. A. March); such a graduate in the service of the State as he who sits before us (Secretary Ramsey); such a graduate in the service of the Church as he who sits upon my left (Prof. William Henry Green); such neighbors in Easton as hailed our progress through the streets this morning toward this hill of science; such ladies as have welcomed us to this college assembly; such a landscape engineer as he (Mr. Donald G. Mitchell) who has so skilfully brought out the beauties of this beautiful site. (Applause.)

We regard this day as in many respects auspicious. It marks recovery from adversity; it indicates growth; it testifies to the harmonious relations which are here maintained by the students of theology and of science; it shows us how cordially a man of letters, the representative of culture, can endorse a school of technology, the embodiment of utility. More than that, it has given an occasion for the President of the United States, who has shown eminent wisdom and patriotism in discharging all the duties of his lofty station (applause), for the Governor of Pennsylvania, for the General of the Army, and for many other distinguished citizens, to bear public testimony to the value of a college whose glory it is to have been for more than fifty years the promoter of sound learning free from bigotry and pretence, varied in scope, adapted to the training of young men for all the learned vocations of life. (Applause.)

It was a suggestive ride, Mr. President, which we took this morning from Philadelphia, crossing the Delaware with Washington's successor in the Executive office and Washington's successor in the command of the army, and listening to the familiar story which fell from their lips of "the crossing of the Delaware" under very different circumstances a century ago. I could not but think with what pleasure Washington, if gifted with prophetic eye, would have looked forward to this time, when the name of his great ally, Lafayette, before whose likeness we are sitting, should become the synonym for a college, and when his successors in office should journey, in mid-winter, from Washington to Easton that they might show the value which they set upon liberal education. (Applause.)

In the Johns Hopkins University, Mr. President, we have special reasons to speak well of Lafayette College, for one of our ablest Trustees, Mr. John W. Garrett, is one of your Alumni (applause); our Associate Professor of English, if not a graduate at Easton, is at least a pupil of Dr. March, to whose generous commendation we owe his appointment; and three young men, a mathematician, a chemist, and a linguist, have held the office of a

Fellow among us, one of whom entered the service of the U. S. Coast Survey while continuing to be a member of our academic staff; a second returned to Easton as a member of your Faculty; and a third remains with us in the prosecution of his studies. (Renewed applause.)

Allow me also, Mr. President, to remind you that the first student of the Johns Hopkins University was a graduate of Lafayette. You gave him a letter of introduction to me, saying that he was regarded here as a mathematician of promise. Under the guidance of Professor Sylvester this promise soon developed into performance. He graduated as a Doctor of Philosophy. He began to contribute to the advancement of mathematical science by the publication of important memoirs; and last summer, when a delegate from the University of Cambridge visited Baltimore, it was his great desire to see this young scholar and tell him that his writings on hydro-dynamics were used as text-books in that great English university where the science of mathematics has been so long and ably cultivated. Under all these circumstances I take pleasure in responding for the "sister institutions of learning," and in congratulating Lafayette on the excellent progress it is making under the fostering care of its President and Faculty. (Great applause.)

To respond to the same toast he also called upon Hon. Robert A. Lamberton, LL.D., President of Lehigh University, whose eloquent speech was received with long-continued applause. His allusion to Hon. As a Packer, the founder of Lehigh University, was most appropriate and eloquent; and his graceful references to the cordial and generous relations of the two neighboring institutions—Lehigh and Lafayette—were received with loud cheering. He further said,

In your night of trouble we sorrowed with you. And we rejoice with you to-day! Lehigh by this sign extends her hand in congratulations to Lafayette (he said, as he reached across the table and shook hands with President Cattell), and heartily prays, God bless Lafayette College! God bless Mr. Pardee! God bless Dr. Cattell!

Dr. Cattell said the Trustees and Faculty of the College had been delighted with the cordial letters received from the Theological Seminaries with which the College had been so closely identified; and to respond for these he called upon William Henry Green, D. D., LL.D., the distinguished Professor of Hebrew in the Theological Seminary at Princeton. Dr. Green is a graduate of Lafayette College (Class of 1840), and the Alumni and all the friends of the College are justly proud of his career as a scholar and leader in the Church. His address was listened to with profound attention. He said:

MR. PRESIDENT, LADIES AND GENTLEMEN: My colleague, Rev. Dr. Moffat, and myself have been charged to bring to you the greetings of

the institutions at Princeton on this auspicious and joyous occasion. It is an embassy which, for personal reasons, we take a special pleasure in fulfilling, for we are here revisiting familiar scenes. We, too, belong to Lafavette. Years ago my honored colleague was my preceptor in this college. He as a former Professor and I as an alumnus of this beloved institution cherish a lively interest in its welfare. And we exult in what our eyes behold this day, in the noble structures which adorn this beautiful hill, devoted to literature and science, with their appliances for the highest education, and especially in this stateliest of them all, the ornament and the pride of this whole region, whose restoration we now celebrate. (Applause.) As I stand here memories of the past crowd upon me, which I hail as auguries of a yet more distinguished future. I cannot recall the history of this College from its humble beginnings to its present expansion and note what has already been achieved, and look upon the abundant signs of promise which now appear, without the most gladsome anticipations. The highest aspirations shall be fulfilled of the great and good men who founded it. It shall be a crowning benediction to this great Commonwealth, holding high rank among the literary institutions of the land, adding lustre to American scholarship, and sending forth year by year increasing numbers of well-trained and disciplined sons who shall do her honor in the various professions and walks of life. (Renewed applause.)

Gladly, then, do we tender to you the greetings and congratulations of the venerable College of New Jersey, and particularly those of Princeton Theological Seminary, which we more immediately represent. Princeton Seminary rejoices in your joy as it sympathized in your sorrow. And the interest which she feels is not merely that of personal regard for those esteemed and excellent scholars who preside over this institution and conduct its affairs, amongst whom she recognizes now as formerly some of her own cherished sons; nor does it merely arise out of the fact that she has both adopted into her Faculty and numbers among her students those who were once connected here, and who have no thought of repudiating the silken tie which still binds them, and will ever bind them, to this College; nor the additional fact that a goodly number of Alumni are common to both institutions, who, in prominent positions or in obscurer spheres throughout this country and in various parts of the world, are doing their work creditably and well. Our presence at these festivities has a deeper significance than this; it represents a firmer and more intimate bond, the alliance of theology and of liberal learning. What is so conspicuously true of this College is likewise true of the vast majority of the colleges of this land and of the principal universities in foreign parts. As a rule, they were founded by the pious zeal of those who recognized in Learning the natural handmaid of Religion, and who were inspired by an eager desire to rear a well-educated ministry of the gospel. Who have been the founders and the foremost friends of our American colleges? Who their presidents and professors? And who those large-hearted benefactors by whose welldirected munificence these comparatively recent institutions are coming to rival in their equipments and resources the famous universities of the Old World, enriched by the accumulations of ages? They are men who, for the most part, were animated by equal zeal for Christian truth and for the promotion of sound learning; it is the friends of religion who everywhere

and at all times have chiefly been the favorers and patrons of education and of the liberal arts; and this from the well-founded conviction that ignorance is the mother not of devotion, but of superstition and corruption. (Applause.)

And it is especially appropriate and significant that the occasion upon which we are sent with our congratulations is the dedication of this elegant edifice devoted to physical science. Much has been said of the alleged conflict between Science and Religion. We have no fears of any such conflict. Let investigation into the secrets of Nature be pushed to the furthest possible extent; the student will, as we are told in the admirable address of Prof. March, be but tracing out the thoughts of God. We rejoice in all that is developed by men of science in their earnest, patient search after truth. Only let it not be forgotten that unproved hypothesis is not fact: the dreams of scientific men, however eminent, are not science. Much less are they to be trusted who, blinded by exclusive devotion to one pursuit, lose sight of all that lies beyond this narrow range; who are so shut up within the region of physical causation that they cannot rise to the conception of Him who is the supreme cause of all; who are so preoccupied with what is material and tangible that they are oblivious of man's immaterial and immortal part, and find no room in their system for free agency, morality, and obligation, until it comes to be seriously questioned whether life is indeed worth living, and materialistic philosophers themselves shrink back alarmed at the disastrous consequences of that loosening of all moral restraints which follows from their principles. We wish learning, but not at the expense of character, not at the expense of all that makes learning desirable. (Applause.)

And, on the other hand, it is unsafe to entrust the defence of religion to incompetent champions, however forward they may be to enter the lists in its behalf—who dogmatize in the face of facts which science has clearly established, but of which they are in blissful ignorance. What is wanted is a body of men trained in the thorough study of nature from a Christian point of view, who can intelligently apprehend and appropriate every fact of science by whomsoever made known, and set it in its proper relations to universal truth—who will aim to exhibit nature as, what it truly is, the handiwork of God, and evolve from every feature of it materials for his praise. Looking for such results from the scientific study here pursued, we cordially bid you God speed! (Great applause.)

Referring to the dedication of the first Hall in 1873, Dr. Cattell spoke of the presence, among other distinguished educators, of Hon. James P. Wickersham, LL.D., the Superintendent of Public Instruction in Pennsylvania, and also alluded to his admirable speech upon that occasion. "To-day," added he, "we have also present a gentleman eminent among educators and scholars—Hon. John Eaton, LL.D., the United States Commissioner of Education, whom I now have the pleasure of introducing to you."

General Eaton's speech was full of interesting and valuable information, of which we hope to make use in subsequent numbers of the *Yournal*. He said the gifts for educational purposes from private citizens in America had already exceeded \$50,000,000. Referring to the speedy restoration of Pardee Hall, he said it reminded him of the announcement by the French of the death of the king, followed in the same sentence by the salutation to his successor: *Le roi est mort—vive le roi!* There was no interregnum; and it is a cause of pride and joy to all educators that the announcement which carried sorrow all over the country, "Pardee Hall completely destroyed by fire," has been so speedily followed by the salutations and greetings of the multitudes assembled to-day at the dedication of a new hall as royal in all its appointments as its predecessor. (Great applause.)

The last speaker was Rev. S. A. Mutchmore, D. D., of Philadelphia, who was called upon to respond for "The Press." The President said that the Faculty and students at Lafayette had heard many excellent sermons from Dr. Mutchmore in the visits with which he had favored the College, but many more had heard from him through the columns of *The Presbyterian*, of which he was the editor. Many of our readers have heard the doctor at Lafayette, and need not be told that he was listened to with deep interest. Not being in the pulpit, he could give way to his natural humor, and his graver thoughts were interspersed with sallies of wit. The doctor was in his happiest vein.

The benediction was then pronounced by Thomas C. Porter, D. D., LL.D., Professor of Natural History in the College and a graduate in the Class of '40.

The "post-prandial" exercises were followed by a reception given by Dr. Cattell at his residence, whither the Presidential party, with Gov. Hoyt and many other distinguished guests, repaired. Supper was served at six o'clock. The departure of the President, who left in a special train at seven o'clock, was the occasion of another popular ovation. The streets through which he passed were hung with Chinese lanterns and illumined with colored fires. The train moved from the dépot amid the loud cheers of an immense throng of people.

In the evening the whole of Pardee Hall was brilliantly illuminated and thrown open to visitors, who crowded the rooms and corridors. At eight o'clock a fine display of fireworks was given by the students in front of the Hall—a special account of which we reserve for our next number—and as the College Band played its "good-night" the great multitudes slowly wended their way down the hill, and thus ended happily THE GREAT FESTAL DAY.

DESCRIPTION OF THE NEW HALL.

THE following description of the new Hall is also taken from the December number of the Lafayette College Journal:

In its exterior the new Hall is essentially the same as the old. The original plan, designed by the distinguished architect, Mr. John McArthur of Philadelphia, has been adhered to, except where experience has required or suggested alterations. The new Hall presents, therefore, the same beautiful and stately proportions that called forth the admiration of every beholder.

GENERAL DESCRIPTION.

The edifice consists of one centre building, five stories in height, 53 feet front and 83 feet deep; on each side of the centre building a lateral wing extends 61 feet in length and 31 feet in depth. Each lateral wing terminates in a transverse wing, 44 feet front and 84 feet deep, thus giving to the building an entire front of 256 feet; while the walls built of Trenton brown stone, with trimmings of Ohio white sandstone, the main entrances with their massive but well-proportioned columns, the beautiful Mansard roof with its graceful iron crestings and the appropriate cornice-work, give stateliness and grandeur to the whole structure.

The main entrance on the south side opens into a large corridor, which connects with the corresponding entrance on the north side. This large corridor is intersected by a smaller one which joins the departments of Natural History and Mineralogy. These corridors are tastefully frescoed, and upon the walls are hung drawings and plaster casts representing various classes and species in the animal kingdom, and give intimations of the rich collections in Palæontology, etc. to which they lead.

THE DEPARTMENT OF NATURAL HISTORY.

The north-west room on the first floor of the centre building is for the use of the Natural History Society of the College, which has made an almost complete collection of the local flora, minerals, rocks, birds, and insects. The museum of collections in Natural History occupies the first floor of the west lateral wing. Here are arranged, in beautiful cases of stained ash, specimens representing the different branches of Natural History. Two large alcoves at the east end contain the collections of the Society of Natural History already referred to. These collections are the result of the society's labors over an area whose radius is thirty miles, the College being taken as a centre. In the other alcoves are arranged a complete series of skeletons, illustrating the species of animals, also a series of Professor Ward's casts, and the purchases made for the College by Professor Hitchcock in Europe. In addition to these numerous relics of a former age, there are many things which will engage at once the attention of the scientist and the curiosity of the multitude, such as the beautiful collection of birds, birds' nests, and birds' eggs, comprising many rare and valuable specimens; the collection of shells; the excellent representation of the local fauna; the group of Indian relics, arrow-heads, stone hatchets, pieces of pottery, etc. The first floor of the west transverse wing is also devoted

to the department of Natural History. On the south side of the corridor are Dr. Porter's private rooms and the Botanical Laboratory, with the College Herbarium, which contains the most complete flora of Pennsylvania in existence. On the north side of the corridor is the large class-room of Natural History, 50 feet by 44, equipped in the most thorough and approved style with blackboards, charts, diagrams, and specimens used in the daily lectures and recitations.

COLLECTIONS IN MINERALOGY.

The main collection of Mineralogy occupies the first floor of the east lateral wing (61 feet by 31). The cabinets are ranged around the walls, while in the centre of the room are rows of horizontal cases. This room contains most of the treasures of the old cabinets, which were fortunately saved from the fire, among which are the large and splendid collections of Dr. Beadle and those of the Pottsville Scientific Association. It has recently been enriched by the fine collection of minerals made by Mr. Jacob Wagner, one of the founders of the College, and presented to the institution by Dr. Joseph Mixsell of Easton. The collection of Northern antiquities, purchased by Dr. Beadle in Europe, which was in the old Mineralogical Hall, now occupies cases in the corridor facing the main entrance, where have also been placed the Swedish iron ores and the products of their reduction, presented to the College in 1876 by the Jern Kontaret of Sweden.

THE DEPARTMENT OF NATURAL PHILOSOPHY.

The Department of Physics and of Theoretical and Applied Mechanics occupies the basement and the entire first and second stories of the east transverse wing, together with the second story of the east lateral wing, above the Mineralogical Hall and of the same dimensions. On the first floor of the east transverse wing south of the corridor are Dr. Moore's private room and his workshop, which contains machinery for making or repairing apparatus used in his department. The motive-power for driving this machinery is furnished by one of Otto's gas-engines. The two rooms north of the corridor are used for photometry and laboratory purposes. On the second floor of the east transverse wing is the lecture-room (53 feet by 35), which has been designed and constructed in a manner to satisfy even the most critical. The chairs are arranged in semicircular tiers rising one above the other; the counters are portable, so that they can be moved to suit the purposes of the professor. For optical experiments requiring the exclusion of light the windows have been furnished with patent roller slides, which when drawn shut out every ray. Around the walls and from the ceiling are suspended by ingenious appliances the screens, charts, and diagrams used for illustration in the various branches of Physics. Instead of having portable gas-tanks for the oxhydrogen blowpipe, as heretofore, permanent ones in the basement are connected by pipes with the lectureroom above. In the basement are also placed the large batteries which are used for experiments in electricity. An hydraulic elevator affords a speedy and easy communication between the basement, the workshops, and the lecture-room. North of the lecture-room is the laboratory for Physical Research, connected with the rooms below by an elevator. The machine used in the experiments with electric light is one of the latest made by the U. S. Electric Lighting Co., and was presented to the College by Mr. M. Hartley of New York City. The second floor of the east lateral wing contains the cases in which are arranged the instruments used in the many experiments that relate to Theoretical Mechanics, Magnetism, Electricity, Heat, Sound, and Light. The apparatus recently procured in Europe by Dr. Moore not only increases the already large collection, but also assures the student that the department is abreast of the science of the day, and that the latest results of scientific thought and investigation will form part of its course of instruction. No labor or expense has been spared to make this department of Natural Philosophy efficient in every sense of the word. Upon every hand the observer is impressed with the utility, the neatness, and beauty of the various appointments, while the large and varied collection of scientific apparatus for the uses of the lecturer will warrant the assertion that the equipment of this important department is not excelled, and is scarcely equalled, in any American college.

THE AUDITORIUM.

The second and third stories of the centre building are occupied, as in the old Hall, by the Auditorium (61 by 47 feet). It is connected with both the lateral wings and with main stairways at the front entrance, which also lead to the galleries. The platform, doors, wainscoting, and gallery fronts are finished in black walnut and ash. The Hall is fitted up with cushioned chairs which have reversible seats. At the rear of the platform is an anteroom, which connects with both of the hallways and also with the balcony in front of the building. Immediately above the platform is the Music Gallery. Throughout the internal arrangement of this splendid room are seen rare combinations of the useful with the beautiful, while the frescoing, finished in the modern renaissance stucco, bronze, and illuminated colors, the tasteful chandelier (the gift of Mr. Benjamin Thackara of Philadelphia), the neat gas-jets around the walls, the graceful designs, the harmony of colors, the emblems which represent the different branches of science, give to the interior a beauty superior even to that of the former Hall.

GEOLOGICAL HALL.

Immediately over the Auditorium and of the same dimensions, occupying the fourth and fifth stories, is the large hall for the collections in Geology, Palæontology, etc. To support the weight of the specimens which will be exhibited in this department the floor is supported by immense iron-trussed girders built into the walls. On the east side this hall opens into the drawing-room of the Civil Engineers; on the west side into that of the Mining Engineers. For the present this central room will be assigned to the Department of Physical Culture, and will be fitted up and used as a Gymnasium. It is admirably suited for this purpose, but the friends of the College are hoping that some munificent donor will provide the means for the erection of a separate building, and release this room for the numerous important collections of the College, which cannot be displayed to advantage in other quarters.

THE WARD LIBRARY.

The second floor of the west lateral wing has been assigned for the use of the Ward Library, the gift of the heirs of the late Hon, C. L. Ward of Towanda. It numbers about 10,000 volumes. Besides many rare and valuable books, it contains a large collection of autograph letters, maps, and engravings. Some of the books date as far back as 1520. Among its literary curiosities may be mentioned Raleigh's History of the World; America, an Accurate Description of the New World; the Cromwelliana, comprising a great number of old portraits and also fac-similes of historical documents relating to the times of the Commonwealth. In the department of History and Biography there are about 1200 volumes. Under the head of Travels and Geography there are 1200 more. The edition of English Poets, together with Johnson's Lives contains at least 400 volumes. Besides these there is a very large collection of general literature, works upon Theology, Medicine, Law, Science, Philosophy, Parliamentary Debates, Encyclopædias, Dictionaries, and the classics, both ancient and modern.

It is the intention of the College authorities as soon as possible to arrange this valuable library in its new and commodious quarters, thus affording the student ample opportunity for enjoying its rich and varied contents.

LANGUAGES AND LITERATURE.

In the west transverse wing the Modern Language class-room occupies the northern portion of the second floor, while on the opposite side of the staircase are study-rooms for the professors. The third floor of this wing is divided into the Rhetorical class-room on the north and the Library of the Washington Literary Society on the south. The library-room opens into the main hall of that society in the west lateral wing. The Franklin Literary Society will occupy the corresponding rooms in the east lateral and east transverse wings with its library and hall. These halls will be occupied by the literary societies for weekly meetings for culture in oratory and debate.

CIVIL AND MINING ENGINEERING.

The two rooms in the east transverse wing, north of the library of the Franklin Literary Society, are class-rooms for the Civil Engineers. The corresponding rooms on the fourth floor of the same wing are to be used as class-rooms, laboratories, and rooms for apparatus and models and the hall for the Society of Physics and Engineering. In the west transverse wing ample provision is made for the Mining Engineers. The laboratories for assaying, etc. have been removed to Jenks Hall, which has been appropriated, according to its original design, to the Chemical Department. The drawing-rooms for the Civil and Mining Engineers, as before observed, are upon either side of the Geological Hall—each 61 feet by 31, and well lighted. Two rooms at the front entrance of the building, east of the main corridor, also belong to the Engineering Department, the northern one to be used for recitations in the mathematics of the course, and the one south of the hall for models and instruments in daily use. In all the departments of Engineering, Natural History, and Physics the studies and lectures are illustrated by a series of colored wall-charts, thirteen hundred in number, many of which were prepared especially for this College, and give illustrations not otherwise easily accessible to students.

WATER-SUPPLY AND PROTECTION AGAINST FIRE.

An abundant supply of water is conveyed by pipes to all parts of the building from a large boiler-iron tank placed on the upper floor of the centre towers. The water is forced up to the tank by a large Worthington pump placed in the cellar for this purpose, and which also furnishes speedy and efficient means of extinguishing fire should such a calamity occur.

Stand-pipes, connected both with the pump and tank, are erected in all the hallways of the building, having on each floor, and also upon the roof, where they terminate, two-inch outlets, with fifty-feet sections of hose attached and ready for immediate use. The full force of the Worthington pump can be thrown upon the stand-pipes, and a powerful stream speedily brought to bear upon any part of the building.

As a further protection against fire, rolling steel shutters, working in iron grooves, have been placed in all the doorways leading from one part of the building to another. These are kept closed at all times except when the building is in actual use. The cornices and dormer windows (in the former building made of wood) are now of galvanized iron. The floors immediately over the valuable collections in Natural History and Mineralogy are filled with brick and mortar, so as to render them practically fireproof.

HEATING AND VENTILATION.

No effort has been spared to make the combined system of heating and ventilation as complete as experience and modern science can devise. Mr. John Sunderland of Philadelphia, who has had a large experience and great success in the heating and ventilation of large buildings, is the author of the general plan. Fresh air is supplied to the building by means of a spacious air-duct running underneath the cellar the entire length of the building, terminating at either end in vertical columns opening into the outer air. From this main duct there are lateral ducts leading to each of the numerous banks of radiators in the cellar. Fresh air is thus conducted directly from the outside of the building to the steam-heated radiators, over which it passes into separate and independent flues, leading directly to each of the rooms in the several stories of the building.

The ventilation is by means of flues in the walls leading from the floorline of each room to the cellar, where they terminate in ducts along the base of the cellar-wall, which ducts are carried from the extreme ends toward the centre of the building, enlarging gradually as they approach the centre, where they are all gathered into two main ducts, which terminate in two large air-shafts that are carried up through and out of the top of the front towers. The air in these ascending shafts is kept in constant motion by a bank of steam-radiators placed in the base of each shaft. By this means there will be a constant ingress of warm, pure air to the rooms, and an egress of impure air carried down through the ducts in the walls. By this system the very best results obtainable in heating and ventilation are looked for.



A SERMON COMMEMORATIVE OF THE

Life and Character

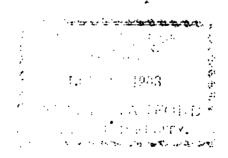
OF THE

Rev. Lyman Coleman, D. D.,

LATE PROFESSOR IN LAFAYETTE COLLEGE,

BY THE

REV. ALFRED H. KELLOGG, D. D.





A SERMON COMMEMORATIVE OF THE

Life and Character

OF THE

REV. LYMAN COLEMAN, D. D.,

LATE PROFESSOR IN LAFAYETTE COLLEGE,

DELIVERED IN THE FIRST PRESBYTERIAN CHURCH, EASTON,

JUNE 25th, 1882,

BY THE

REV. ALFRED H. KELLOGG, D. D.,

PASTOR OF THE JEFFERSON AVENUE PRESBYTERIAN CHURCH, DETROIT.

PREACHED AT THE INVITATION OF THE FACULTY AND PRINTED AT THE
REQUEST OF THE BOARD OF TRUSTEES OF LAFAYETTE COLLEGE.

EASTON, PENNA.

ZECHARIAH I, 5: "Your fathers, where are they? and the prophets, do they live forever?"

One cannot long muse over the story of human mortality without noting how, sooner or later, the whole of a generation passes away.

Each new generation is charged with burying, not only the most of its own dead, but those also who have, perchance, survived the majority of their own generation. Neither the "fathers" nor "the Lord's prophets," i. e., neither age, nor wisdom, nor experience, nor useful lives are excepted. The fact we emphasize is, of course, a Divine arrangement, but is suggestive to a thoughtful mind of many a question as to what it signifies. We once asked our departed friend, "Is it not strange that we go on gathering experience and then are summoned to die just as we seem ready to live?" and his reply was characteristic: "It is a valid argument for immortality. The accumulations of this It must be that, when so ready to live, we life cannot be lost. shall live again." All that we who survive can do is to bury our mighty dead, tenderly and regretfully, and then to remember them and follow them. Is it not well, also, if we can, to study their lives, to discover the influences that moulded them, to trace the motives that actuated them, and to compare these with what they accomplished in their life-work? Such studies are often (particularly in this land of ours) encouragements to merit that has been born in obscurity and is called upon to contend with obstacles and difficulties. There was good reason, we may be sure, why so much of the Bible was made up of biography.

I sometimes think that Christian people, carelessly reading of the triumphs of piety in Bible times, either unconsciously imagine that such exalted lives are nowadays impossible, or regard them as ideal portraits more or less exaggerated, when a more careful study would prove how very much like our modern human nature was that human nature of old. This is likewise true of the power of Divine grace—it is the very same in its possibilities to-day that it was three or four thousand years ago. God's goodness to His Church is in no respect more conspicuously shown than in the fact that each era of the world has added names of renown to the roll that began with righteous Abel. Could the pen of inspiration record the history of these times of the dispensation of the Spirit as it did the Old and New Testament times, methinks there would stand out in bold relief as many religious heroes as are found in the Bible. Some of them are so near to us that we fail to perceive the measure of their greatness and goodness. The man whom to-day we commemorate, in presence, in purity and simplicity of life, in gentleness of spirit yet moral courage withal, in unselfishness of aim, in high-minded, disinterested generosity; in a generous hospitality, in unaffected humility, in reverence for God and Divine things, in child-like faith, might easily suggest a saintly, patriarchal life, such as that of faithful Abraham. Exalted Christian character is as possible to-day as ever. Equally great, nay, greater, opportunities of valiant faith and heroic service are furnished now as in Bible times. We may not only admire faith, but emulate it. Surely no apology in this presence is needed for a careful study of the career and character of one who, whatever else he was, was a man who "walked with God and was not, for God took him."

Lyman Coleman was born in Middlefield, in the State of Massachusetts, June 14th, 1796. His father, William Coleman, was a physician. His grandfather, Seth Coleman, was likewise a physician, as also a deacon for many years in the church at Amherst, where he resided. In his later years, the Doctor took great interest in tracing his ancestry through both lines to their English home—publishing the results in two volumes of considerable interest to all concerned. From these works we learn that the first of his family arrived in Massachusetts in 1634, and it is mentioned as a noteworthy circumstance that his whole line from the beginning continued to reside in the same county.

The Doctor was also fond of saying that his was a pious ancestry—that the succession, from generation to generation, had been without exception in connection with the Church—many of them, indeed, called to hold honorable office in the Church of God.

His mother was a Lyman, with the Scriptural name of Achsah. She was a devout, humble Christian woman, who lived long to rejoice in the honorable record of her son, and in her old age to receive the tender and grateful ministrations of one who always pronounced her name with reverence. Long life is not always a blessing, but when adorned with Christian graces and full of serene hope, it is put first among wisdom's earthly rewards. And it is mentioned as a remarkable fact, in this connection, that "the married life of the parents extended over a period of nearly sixty-six years, the father dying first at the age of ninety-two, and the mother at the age of nearly ninety-five."

It is, further, interesting to note how much of his earlier life was spent in his native county; for, besides his childhood and youth, Belchertown, which furnished him a seven years' pastorate, and Amherst, where he taught for five years, were both in the same county. And no one familiar with the beautiful scenery of the Connecticut Valley and the Hoosac Mountains can fail to see in the Doctor's long residence there the secret of that love of nature which was with him almost a passion. In a letter dictated last December to Rev. Mr. Lyman, of Belchertown (among other things), he said, "In my private musings I am habitually traversing those hills and valleys." We can better understand the impatience with which he lived nine long years in Philadelphia, his common criticism of that city being, "What it most needs is a hill or two." We can also understand how he lived so long and so contentedly here in Easton, for he found in its surroundings a constant reminder of the hills of his boyhood and manhood. Understanding these facts, one could easily condone his very frequent references to his pious ancestry and his Massachusetts home.

Few facts are known respecting his childhood and youth. He was wont to say when reference was made to his stature that he

was just as tall (and he would add playfully, just as ungainly) in his seventeenth year. The earliest pictures of him represent him with that bright and intelligent eye which was, next to his tall form and handsome, ruddy face, his most marked physical characteristic.

His father had been only ordinarily successful in his profession and, on the whole, preferred that his son should not choose a professional life, and therefore, as the Doctor used to say, for the most conscientious of reasons, very much discouraged young Lyman's evident taste for books and, above all, any notion of going to college.

He received no more than the ordinary education of the village school. His idea of becoming a minister of the gospel was most seriously resisted, for the son was so very bashful that the father believed that he could never face a congregation. And so the young man became accustomed to farm and garden toil, thus acquiring not only a stronger physical constitution, but that meditative character and that practical knowledge of nature and of life which was so surprising to many who had known of him only as a man of letters. It was in the intervals of work that he literally picked up his preparation for college, and when the proper time came he determined to go, notwithstanding parental remonstrances that were meant in kindness.

His father was so grieved by his decision that he not only gave him no assistance, but never after even inquired as to his progress in college. He set out on horseback for the long ride to New Haven with scarcely enough means to more than reach the place and with no very clear idea how he was to maintain himself there.

There was no Board of Education in those days to assist needy and deserving young men into the ministry. Such were in the habit of helping themselves, and thus was developed a race of self-reliant, stalwart teachers and preachers that have always been the pride of New England.

The story of his college economics would be painful, and we do not propose to rehearse it here. Suffice it to say that, partly by teaching, partly by labor, and partly by borrowing, the ardent

student got through his prescribed college course, graduating in 1817, when twenty-one years old. Then, to repay his loans and enable himself to go on with his theological studies, he began to teach. He always expressed great gratitude to President Day and Dr. Timothy Dwight for their almost paternal kindness and sympathy, particularly specifying their frequent loans of books, for even then he had an insatiable thirst for literature. He also often referred to the kind indulgence of the bookseller of the town, who allowed him at will to consult the volumes on his shelves. It was in that bookstore he came across a very primitive classical atlas, the possession of which, though much coveted, was far beyond his means. It was this experience, especially as regards the lack of proper maps, which led to his purpose, very early formed, to make that department a special study, and which resulted in his own Atlas of Biblical Geography and the incomparable map of Palestine, with which we are all so familiar.

After graduating, he held for three years the post of Principal in the Latin Grammar School at Hartford, Connecticut, residing for a considerable time in the family of Dr. Hawes, the pastor of the Congregational Church. He always recalled his intercourse with Dr. Hawes with gratitude. He there saw much of the practical work of a pastor and met many men of renown in the Church, and acquired greater freedom in society, though to the last he used to say that he had a profound sympathy for diffident men. It was while residing in Hartford that he came into contact with Mr. Nettleton, the New England revivalist. He had abundant opportunities of observing and studying Mr. Nettleton's methods, and many of his best stories were connected with the work of that remarkable man. His experiences with Dr. Hawes and Mr. Nettleton may be said to have shaped his whole ministerial career. No man better understood the nature of a revival and how to guard against the evils that would seem to be inseparable from them. He used to say that if he was conservative on the subject of revivals (and he was), he learned it from the apostle of revivals, Mr. Nettleton.

From Hartford he returned to New Haven—this time as a

college tutor, which position also furnished him an opportunity for going on with his study of theology. In this way four years were passed. He enjoyed this period, he used to say, more than any other period of his life. He had fully repaid the sums he was obliged to borrow in order to get through college. He enjoyed teaching. He took great pleasure in his theological He made many valuable acquaintances, not only with the faculty, but in the town. He was constantly meeting public men from all parts of the country, and so gathered information as to politics and finance, as well as literature, science and theology, which was the foundation of that varied information which so astonished his intimate friends of later years. mainly interested in a few departments of knowledge, he had a very rare acquaintance with many and diverse subjects of study. He understood almost as well the mechanism of a steam-engine or of a clock or of the modern furnace as though he were an expert. To the last he was all interest in reading or hearing of some invention or important discovery in science or the arts. There were few subjects, indeed, concerning which he manifested no interest. Next to a naturally inquisitive mind, he was accustomed to attribute much of it to the life he led as a Yale tutor, when he met all sorts of people interested in all sorts of sub-

His life vocation as a teacher was interrupted by an episode of pastoral life. On October 19th, 1825, he became pastor of the Congregational Church of Belchertown, Mass., and continued as such until August 27th, 1832. This was his only pastoral charge. Abundant testimony is at hand to show with what conscientiousness and efficiency he served that church for At his ordination he found a church of 364 seven vears. members. During his pastorate 178 persons united with the church, being an average of over 25 per year, and he left the church—allowing for deaths and dismissions—with 457 members, a net gain of 93. From a sermon to the Belchertown Church by its present pastor, preached March 19th (an abstract of which has been kindly put into my hands), it appears that only 4 of the 364 members who greeted Dr. Coleman at his installation survive, and that only 14 remain of the 178 who united with the church during his pastorate. When he began his Belchertown ministry the Sabbath school was a new institu-It was his aim to make the school include adults as well as children, and he succeeded in making the whole congregation a Bible class, a fact which he always recalled with lively satisfaction. During his pastorate there, moreover, the church building was considerably enlarged, and a separate house erected for the social weekly meetings. He was also deeply interested, and succeeded in interesting his people, in the work of foreign missions, which just then took such an impetus from the revival of the missionary spirit in the Churches, as evidenced by the foundation of the American Board. He was an early advocate of the temperance reform, organizing a society in the church which increased from 11 at the start to 700 members. used to tell with great glee how thoroughly converted was one of the whisky sellers in the town, inasmuch as, instead of selling out his stock when he quit the business, he brought out his whisky barrels and emptied their contents into the gutter.

It was estimated that the town had saved by this reform which he fathered "enough to defray the annual expenses of the town and the society."

Notwithstanding the work accomplished at Belchertown, the Doctor believed that he could better serve the Church in the vocation of a teacher, and therefore at the end of seven years—very much to the regret of the people—he sought a dissolution of the pastoral relation.

He always retained a vivid recollection of that episode in his life, and in a variety of ways manifested his continued affection for the church and town, a feeling that was reciprocated by the society. Long after the generation that he served had passed away, his name and pastorate had become one of the sacred traditions of the church. As lately as 1878, forty-six years after leaving it, he visited the town and assisted at the communion service of the church, saying in his address—among other things, in his inimitable way—"I stand here to administer the sacrament to this people, but they are not my people."

Previously in 1872, just after his ascent of Gray's Peak while on his tour westward, he had sent the church a congratulatory message on the occasion of the dedication of their new building. In a letter already referred to as dictated last December to Mr. Lyman, the church's present pastor, he says: "I grieve to think that I shall no more return to that place, sacred to me by many interesting associations."

It was at the period at which we have now arrived, in 1832, that the Doctor entered on that career of teaching as a profession which was to be his distinctive life-vocation for nearly half a century more. First he became head of Burr Seminary, in Manchester, Vt. He often alluded to the fact that it was then and there in his school that the well-known Dr. John Lord prepared and delivered his first course of historical lectures. During his last illness he seemed to be living over again that life at Manchester. How often did he allude to the place, and, as he expressed it, to "the choice young men who came to Burr Seminary." After spending five years at Manchester, he was invited to Andover, where he acted for another five years as Principal of the English department of the Phillips Academy.

A part of the next two years (1842-3) was spent in gratifying a long-cherished wish to go to Europe for travel and study. Seven months were spent in Berlin, where he enjoyed the intimate friendship of Dr. August Neander, under whose inspiration he published his "Apostolic and Primitive Church," Neander prefacing it with a graceful introductory essay. Of this work one reviewer, Dr. Harris, of New College, London, writes:

"Its well-digested and rightly applied learning, catholic spirit and comprehensive plan, cannot fail to place it among standard works in its particular department, and to render it subservient to the final triumph of Scriptural Christianity."

And the London Quarterly of July, 1844, says of it:

"It is too calm, judicious and scholar-like a production to remain unanswered with safety."

. The Doctor had previously published an anticipatory work, entitled "Antiquities of the Christian Church," which, however,

was mostly a translation from the German. "The Apostolic and Primitive Church" was an original work, though he always acknowledged his indebtedness to Neander for practical suggestions while preparing it, and had the rare advantage of Neander's marvelous knowledge of books and their contents bearing on his theme.

Returning home after this episode of foreign study, he entered on a new period of teaching, which was to consume some fourteen years. Three years of it he passed in Amherst, where he became classical instructor, first in the academy and afterward in the college.

Then he was called to Princeton, to fill the newly created chair of German in the College of New Jersey, from which institution also he received his degree of S. T. D.

He always retained a tender attachment to Princeton, for there he buried his oldest daughter, Olivia, who died when only twenty years of age, after a long and painful illness, mitigated by the tender, sympathetic attentions of Miss Mary Maclean, sister of the President of the college, and the family of the late Dr. Hodge. The former he was accustomed to speak of as "an angel of mercy," and the latter's address at the funeral was often cited as a proof of the extraordinary impression his daughter had made in so short a time on Princeton society.

From Princeton the Doctor was called to take charge of the "Presbyterian Academy" of Philadelphia—an institution with which he was connected for nine years. There were few Presbyterian families of position in the city but had representatives in the academy. While in Philadelphia he conducted a large adult Bible class, first in the Tenth Presbyterian Church, afterward in the West Spruce Street Church—in both of which churches his name is to-day a household word.

While residing in Philadelphia he prepared and published the first edition of his "Historical Geography of the Bible" (published in 1850), and in 1852 he published his "Ancient Christianity," wherein he does for the early Church history what he had formerly done for the Apostolic Church. Of this book the Princeton Review says:

"We know of no work in our language which contains the same amount of information on the antiquities of the Church. It is a work which we doubt not will long remain without a rival in that field."

In 1854, while still living in Philadelphia, he published his first edition of the "Historical Text-Book and Atlas of Biblical Geography."

In 1856, being sixty years old, desirous of prosecuting Biblical researches in the lands of the Bible, having particularly in mind a revision of his Biblical Atlas and the preparation of a wall map of Palestine, he made a second visit to the Old World and then went on to the East, spending most of his time in Egypt, the Desert and Palestine. Six young men from his Philadelphia academy accompanied him on this memorable journey. During this visit to the East he sickened at Damascus. He always referred with greatest interest to the care of the American missionaries in Syria, as also to the extraordinary attentions paid to him by the natives.

The interval between his return from foreign travel and his coming to Easton was spent in revisions of his published works and in preparing his wall map of Palestine. No one who has seen this wall map can fail to be impressed with its clearness of typography, bright coloring and general beauty of execution. Great labor and patience were expended to make it accurate and trustworthy, as also in the settlement of disputed geographical sites. It was certainly an immense advance on the ordinary school maps then in use. Since then, however, the English and American "Palestine Exploration" Societies have expended years of labor by skilled civil engineers under adequate Government protection and with resources that could not be commanded by any one individual, and we are soon to have a map of the Holy Land as accurate as a Government survey could make it. Still, the Coleman map answered its purpose, and will remain a monument of what the industry, zeal and strong will of one man can do when in love with his subject. No one was more aware of its defects than the author, and no one took greater pleasure in the forthcoming map to be soon issued by the Exploration Society.

The Doctor continued writing books and essays even after coming to Easton, his "Prelacy and Ritualism" being published in 1869, besides a number of less pretentious articles on subjects connected with his Oriental researches, such as, e. g., one on "The Crevasse of the Jordan and the Red Sea," and an article on "The Removal of the Forests," as explaining the present sterility of the once fertile Palestine.

In 1861, at the age of sixty-five, when most men would be thinking of retiring from active work, he accepted an appointment as a Professor in Lafayette College at Easton, Pennsylvania, and, as the event proved, with nearly twenty more years of opportunity to exercise his life-vocation before him. He began his work here as Professor of Ancient Languages—began it with enthusiasm, and with so few of the infirmities of age oppressing him that he himself for a long while seemed scarcely aware that he was growing old.

With his love of nature as strong as ever, he indulged in long tramps over the hills around Easton, that in the spring particularly are so lovely—tramps that, instead of fatiguing, only invigorated him. Mountain climbing had always been with him a passion, and the love of it was strong to the last, as was also a love of adventure. In 1866, e.g., when seventy years old, he went to the White Mountains. One fine day he rode on mule back to the summit of Mount Washington, remained there over night, and the next day walked down the eight miles' weary tramp to the Crawford House by the bridle-path. To be sure, he was thoroughly tired, but was none the worse for it. And he used to say that he was grateful for the experience, as the corduroy roads (which did indeed seem interminable) had given him a "new symbol of eternity."

Even in 1872, when seventy-six years old, his passion for travel overcame his sense of increasing infirmities, and he started on his memorable journey westward, intending to extend it to the Sandwich Islands, though an accident which befell him in the Yosemite Valley obliged him very reluctantly to give up his plan and to go no further than California. It was during this westward journey that he made the ascent of Gray's Peak—

a feat which cost him the hearing of one ear, while in many other ways he was made sensible that he had attempted too much for a man of seventy-six.

Beginning in the college then, in 1861, as Professor of Ancient Languages, it was not until 1868, seven years later, that he began to see, what his colleagues had already been noticing, that the burden was growing too heavy, and then consented to relinquish the Greek. To relieve the President of the college, whose time was then engrossed in placing the institution on a better financial basis, he for a long time discharged the duty of a Professor of Moral Philosophy. Besides, during the whole of his Easton career, he lectured on his favorite study, Biblical Geography, and, as though this was not enough to occupy him, he gave instruction in Hebrew. For quite a time also he gave private instruction in German to a class of ladies from the town. Then he was always ready to take his turn in conducting prayers in the college chapel and public worship on the Sabbath. For a long period, indeed, the Sabbath afternoon service in the chapel was entirely supported by himself. It was then that he gave his course of "talks," as he called them, on "Israel" from Egypt to Canaan, which, while intended to be practical in the lessons so skillfully drawn from the narrative, were also full of interest, because of the light which his familiarity with Oriental life and traditions enabled him to throw upon the exegesis. was peculiarly gifted with a power of description. He had a quick, observing, discriminating eye and a lively imagination that enabled him at once to seize the salient points either of a landscape or of a narrative. United with this power he possessed a facility of expression which enabled him to reproduce a scene with great fidelity and to set it very vividly before the mind of a hearer. The same trait was observable in the stories he told (of which he seemed to have no end). He always saw the point of a story and could always make the point clear—a gift which made him in social life down to the very end one of the most companionable of men.

During the visit to the White Mountains, already referred to, his quick, observing eye took in the lay of the land in all the

numerous changes the landscape would undergo from the varying points of view. On the Sunday he spent at the "Glen House," invited to preach, he talked on St. John's account of Jesus and the woman of Samaria, and found in the view from the window of the parlor where he was preaching the exact counterpart of the scene of our Lord's talk as He sat by Jacob's well. We are sure that no one of the promiscuous gathering who heard him that day can ever forget either the description or the lessons he drew. As years and infirmities increased he was obliged to give up, one by one, his college duties, until when his last sickness overtook him, he had limited himself to instruction in Hebrew and Biblical Geography and the chapel preaching in his turn.

He was an excellent Hebrew scholar, wedded to his Hebrew Bible—so much so, indeed, that he never left home, if but for a night, without his Hebrew Psalter, and so fond of it, that for years at family worship, in reading the Old Testament in course, he always read the morning verses from the Hebrew, those of us who followed him with the English version in hand noting the frequent variations, often very instructive, of a literal translation.

Those of us who observed the tokens of age sometimes regretted that he would not earlier consent to retire from active duty, but his own view was that such retirement would induce premature mental decay, and that the only way to keep the mind clear to the end was to work to the end. He could not be idle. Idleness, even when enforced by illness, was torture. Even in the intervals of his last prolonged illness, when able once more to see and to read, his time was filled with reading and reviewing his favorite studies. Playfully, last December, he sent to the speaker, then in London, the message that he was again going through the wilderness with the children of Israel that he had got out of Egypt and was making for Canaan. His thirst for knowledge was insatiable to the very last. He remembered his friends and dictated multitudes of letters to his numerous correspondents. The last letter he dictated was in the latter part of January, written in reference to the death of a friend of sixty years' standing. It so well exhibits his poetic imagination, which was strong to the end, as well as his religious hope, that we venture to give the following extract. He says:

"The wave of the ocean rises and rolls in a restless tide for a time, alternately gilded by sunshine and darkened by storm, then sinks and mixes with its original element. Such is our life. We rise into life to conflict with its vicissitudes of light and shade—at one time enlivened by success, then depressed by misfortune. Then life ends and we go the way of all the earth. He has gone before me, but I shall soon follow. God be thanked, there is life above unmeasured by the flight of years. There may we hope to meet again."

When paralysis laid him down utterly helpless, the bitterest thought to him was not that the end was near, but that he could do nothing. By and by his child-like piety led him to acquiesce in the evident Divine allotment of enforced leisure, and then he busied his mind with thoughts and prayers of the Kingdom of God that was so sure one day to fill the earth. months of his long sickness found him serene and cheerful, making frequent reference to the goodness of God, at times indulging in that quiet humor which was ever a characteristic. still observant (as he ever was) of the proprieties of life, patient and gentle, careful to lessen the burden of care on those who so tenderly ministered to him, his mind still wonderfully active for one of his years and infirmities, still interested in life, watching for the coming of the postman and the evening paper, anxious to hear from his friends and to know the news of the day, until, at last, the strong constitution and almost iron will succumbed, and the aged, weary man entered into rest.

His last sermon in the college chapel was preached November 7th, 1880, some sixteen months before his death. During the week that followed he was overtaken by a shock which proved to be a premonition of the paralysis that before the Thanksgiving day of that year made him for so long a time a helpless sufferer. On Sunday, November 14th, 1880, though still feeling the effect of the shock, the Doctor conducted family prayer. After reading, as usual, from the Hebrew Bible and repeating, as was his custom, a hymn, he offered prayer. He

could not kneel, but insisted on standing, leaning on his cane and partly resting on the table. He seemed to be aware of his situation, for he confided himself, as well as all of us, to the keeping of God's Providence, "not knowing," as he said, "how soon the summons home may come." How he prayed for the more general sanctification of the Sabbath day! How he prayed for his country (the old man was intensely patriotic), that it might be preserved from an ignoring or forgetfulness, of God! How he prayed for the youth of the land, that they might prove worthy of their traditions and a holier generation than the fathers! We can never forget it, that the last prayer we ever heard him utter was for his country and for the rising generation. He had no petty jealousies of younger men. He rejoiced to see them equipping themselves for the conflict with error, and was ever hoping great things for them. Few instructors have had more sympathy for their pupils. He had himself been schooled in adversity. He knew much of early trials. How often he used to say that "the highest idea of education is to overcome obstacles." Nothing made him happier than to help and encourage young men to meet and overcome their difficulties. He was untiring in watching the development of his pupils and in devising means of stimulating them to greater achievements. They always found in him, in all their troubles, a willing listener and a wise counselor. He died in the early morning of Thursday, March 16th, of the present year, and was buried on Saturday, the 18th of March, in this last home of his that he loved so well.

Years ago, expecting to die, he wished to be buried in his native place, but latterly became content to lie far away from his fathers. And so he lies here, where the savor of his name will long survive, and his tomb be a reminder to the student of coming days of what a life consecrated to God's glory and the service of humanity can accomplish.

This sketch of Dr. Coleman's life-career will show how difficult is the work of characterization; for he was a many-sided man, and possessed of traits that would seem to be opposites, until we look upon them as simple modifications of his natural character, resulting either from a long experience with men or from conflict with more than the usual share of life's trials.

- (1.) The first thing everybody noticed about him was his commanding presence. This impressed young and old, family, friends and strangers. In traveling, whether in his own country or abroad, it at once drew people to him. We are not surprised that when in Syria he should have been taken for an archbishop. And it was not simply his commanding form, but the evident intelligence, kindness of heart, and cultivation that a child could detect in his whole bearing. He was, assuredly, one of "Nature's noblemen." "Even in death," one writes, "he looked noble and serene."
- (2.) Then, he was scrupulously neat—ever dressing with taste and propriety. Nothing so offended him in others as negligence in this respect, particularly on the part of public men. He used to say that there was no use in making one's self less attractive than nature had made us. Many a time he seized opportunities of impressing upon the young the necessity of personal cleanliness and neatness in dress. It was one reason for his extreme antipathy to the use of tobacco. He felt that no one who indulged in such a habit could be neat and tidy.
- (3.) He was, also, scrupulously observant of the courtesies of life. His constant feeling was that religion should make a man a gentleman. In a talk of his on St. Paul's letter to Philemon this was one of the morals he drew: "St. Paul," he said, "in another place bids us 'Be courteous." In this epistle to Philemon, treating, as he does, a very delicate question of casuistry, he unconsciously furnishes one of the best illustrations of what he meant by his precept; for one cannot help noticing with what courtesy and consideration he writes."

He was ever circful not to wound the feelings of the very humblest. The same trait was observable in his care of animals, particularly in his love of birds, who found in him a sympathetic protector. We well remember the righteous indignation once aroused by an attempt on the part of some unfeeling boys to rob a bird's nest on his premises. The finest compliment (he said) he ever received was when a child once told him she believed he wouldn't hurt a fly.

(4.) He was a man of warm sympathies and strong convictions, and with the courage of his opinions, never afraid on occasion of uttering them, though with deference for those who differed from him.

As to religious views, he clung with utmost tenacity to the ancient Biblical and evangelical faith, eschewing as far as possible metaphysical distinctions which seemed to him divisive in their results, but expressing his fullest belief in the Bible and in its view of sin and its punishment, and the so-called "doctrines of grace." No pupil could fail to observe how frequently the phrase, "redeeming grace," came to his lips in his public prayers.

As to political views, social questions and the customs of society, he entertained equally decided opinions—ever bearing a consistent testimony against political corruption and criticising with utmost frankness and even severity the evils and weaknesses of society.

(5.) He was a pure man. Pure in thought, pure in word, he leaves behind him an unblemished life. His simple, unaffected piety was perceived even by strangers. We have heard him tell how once, years ago, traveling by steamboat where he was unknown, the captain asked—as was his custom—for the names of his passengers as they bought their tickets. He subsequently learned that the captain had for years also been in the habit of trying to read characters as he looked at faces, adding in his register to the passengers' names a word or phrase to characterize them. Great was his amusement and, he added, his comfort, too, in discovering that a man who had never before seen him, and then only while buying a ticket at the captain's window, should have added to his name, "a pious man." Surely it was an instance of what St. Paul says all Christians ought to be, "epistles of God, known and read of all men."

A marked trait of his piety was his unfeigned humility, amounting to an almost habitual self-distrust. Nothing in a Christian, young or old, seemed to him so unlike a Chris-

tian as a spirit of self-assertion. He could only hope and trust.

His piety was not ecstatic, emotional, impulsive. It pervaded his whole life and character. It was manifested in an habitual reverence for God and Divine things—even in the reverent way in which he ever pronounced the Divine Name. It also exhibited itself in a childlike faith and obedience, in an humble, consistent walk with God, in filial piety and in-love of kindred, friends and country, in interest in all that concerned the progress of the Redeemer's Kingdom.

(6.) As a student, he was characterized by an honest and ardent love of truth, combined with great patience and industry and an almost judicial fairness—characteristics which made him at once conservative and liberal. He clung to the old foundations of both the Church and the State, but no mere new thing "offended" him, for he believed in progress. He was one of the very few old and older men who refrain from praising the past at the expense of the present. He rejoiced in the evident advance of the Christian civilization. He believed in God and God's providence, as also in the Bible as a Divine revelation; but he also believed in that other revelation which God has made of Himself in nature. He so far believed that the Author of both revelations was one and the same, that the difficulties which some have found in reconciling science and revelation seemed to him to arise simply from an imperfect or incorrect reading or interpretation of one or both of them. And he never had a doubt of the final issue. He welcomed the new sciences, particularly geology and biology, when many a Christian man trembled for the ark of God because of the insane conclusions which were at first hastily drawn by some who were only too ready to discover contradictions. He found his love of nature, indeed, a constant means of grace. One of the favorite hymns of his old age, as it was of his childhood, was that one of Dr. Watts's beginning—

> "I sing th' Almighty power of God That made the mountains rise;"

And ending-

"There's not a plant or flower below But makes Thy glories known, And clouds arise and tempests blow By order from Thy throne."

His knowledge of books was extensive and accurate, for not only had he been all his life an omnivorous reader, but he had early formed the habit of picking out the characteristic features of a work, while he was blessed with a good memory for details as well as outlines. One could not long converse with him without discovering his ample stores of information. His student-life was wonderfully prolonged. While few are spared to live to his years, still fewer live to study and work so long; for he continued to labor at his favorite studies, even when he lay on his back utterly helpless and faithful attendants were obliged to contrive means of holding books and maps so that he could use them. Few men have been so devoted to their life vocation, continuing to labor and study and teach when many younger and stronger than he would have reasoned that it was time to remit such steady toil.

(7.) As a teacher, it is surely unnecessary for me here, where he lived so long, to indulge (even if time allowed) in more than the briefest criticism.

His theory of teaching combined instruction and education. It was in vain (he used to say) to fill a mind, without both educating it, i. e., teaching it how to work, and stimulating it, i. e., encouraging it to exercise its faculties.

Accordingly, his method of teaching, very early formed, ever kept in mind these elementary principles. He gave instruction or information gathered both from books and from his own extensive stores, i. e., he gave the mind something to think about. But he was ever on the alert, trying to teach the young to think for themselves. He indulged largely in the Socratic method of question and answer. He tested his pupils to see how far they simply committed to memory, or whether they were apprehending great principles which could be used ever after in original research. 'He did not believe in leaving the mind to itself without correct first principles of judgment and taste, but sought to impress upon the mind those first truths in morals and religion

without which human nature is sure to wander off into all sorts of vagaries. Then he tried to stimulate the mind to activity and to encourage young men not to neglect the gift that is in them. For all three of these purposes he used to believe that the Bible was, facile princeps, the best of text-books, inasmuch as it is not only a gracious revelation of truth, but an educator and in its doctrine of personal responsibility furnishing just the stimulus and encouragement that a sluggish mind needs.

He was himself a very laborious teacher, ever planning for his classes, in season and out of season. He did not feel his duty discharged with the class-room. He endeavored to cultivate kindly, social relations with his pupils, and made himself accessible to them at all times as a counselor and personal friend. He watched their progress with utmost interest. And he did not forget them after they had left him, nor did they forget him. He has always kept up a large correspondence—a correspondence which was world-wide, and a very large part of this, in later years, particularly, was made up of communications with his pupils.

The personal influence of the teacher has always been one of Dr. Coleman's most marked traits as an educator of youth. Only eternity will reveal the beneficent results of it.

(8.) As a preacher, he looked on himself as under bonds to "preach the Word." He believed in expository preaching, not only following this method himself, but urging it on the younger ministry, who, nowadays, to so great a degree, have fallen into the habit of topical preaching. How often he asked young preachers, "Why give scraps of God's Word to the people, when God has given so much bread?" He had early discovered how pertinent God's Word is to the variety of needs met with in any parish, and how many things exposition enables a man to preach about which would seem strange or too personal if introduced as special topics. He was fond of talking over the Scripture history and biography, often asking those who hesitated to go over such ground because they found greater difficulty than himself in such studies "Pray tell me, why did the Lord make so much of the Bible history and biography?" He was himself pre-eminent in such expositions, drawing not only from his own Biblical researches but from his knowledge and observations of nature, illustrations which were as forcible as they were graphic, and gathering up the moral of the passage in a very solemn and impressive way.

Even the old oak tree in front of his residence could give an illustration that none can forget who heard him give it. He was talking on "conscience," and the strange, uncertain judgments it sometimes gives in the case of even Christian people. The old tree had some dead limbs which were eyesores to him, but which it seemed impossible to reach, so as to get rid of them. "So it is," he said, "with many a Christian conscience—it's that old oak tree over again; conscience is pretty sure to have some dead limbs that neither God nor man can reach."

We have never forgotten the lesson he drew from the scrawls and grotesque figures found so plentifully on the sides of rocks in the Sinaitic group, which, until comparatively recent times, were undecipherable, but which, when read at last, showed how trifling and frivolous they were who spent their time in scratching them. "Young men," he said, "never write anything that one day may be brought back to you as a witness against you."

His sermons were delivered without manuscript or notes of any description, and yet with a readiness of utterance, a precision of language, a connection of thought, a sober earnestness and such an evident sincerity of purpose that it was impossible to go away unimpressed. His devotional exercises were characterized by the utmost reverence, unfeigned humility and childlike faith. He was always practical in his preaching, never unfolding a doctrine simply because of its inherent beauty, but ever with the single purpose of gathering from a passage the mind of the Spirit of God as to our daily life and toil.

Few men have filled at all, fewer still have filled so well, so many and so various departments of human life. When we think of him as a lifelong student, a preacher, a teacher, a professor, an historical investigator, a writer, and reflect how unweariedly, zealously, conscientiously and efficiently he ran his long course of public life, we may well glorify the grace of God that was manifest in him. He came to his grave like the old patriarchs, in a "good old age," full of labors and honor, and

with the respect, affection and gratitude of many a one who will rise up to call him blessed.

How impressive is the departure of an aged saint!

Then is perceived the influence and value of old age to society. As long as these live we depend upon them for advice. Responsibilities are not so keenly felt. But when they are gone, when the last link that unites us with the past is broken, and life's problems must be solved by ourselves unaided, then comes the sense of loss sustained by the removal of age. It would even seem as though the longer such a life is spared, the more beautiful and influential it becomes—like the oak of centuries, with its great arms stretching out in wider and yet wider benediction. It is the only thing remaining to us in these latter days of that patriarchal life which was the peculiar blessing of the days before the flood.

All this is of course doubly true when old age continues in sympathy with life and its interests. I admit that we do not always see this. Often people outlive their interest in life. They retire from active business and service. They do not continue to exercise their faculties, and so allow them to grow dull, and yet many instances there have been and are where a large measure of youthful vivacity and impulses is retained to the end. Dr. Coleman was one of these exceptions, retaining interest in family, friends and society, until a short time before his death.

One lesson of the life that has passed out of our sight should be to teach the young especially that religion does not make people unhappy. God is never better pleased than when He sees his child plucking flowers by the wayside, and eating the fruit of every tree of the garden but the forbidden one, and enjoying life with its opportunities and privileges while looking for the better and the final home.

Learn then from the serene life we have been contemplating the secret of an endurable, enjoyable old age—piety toward God with its assured hope and *interest in life* as long as it lasts. If those of us who knew him well gather no other lesson from his long career he will not have lived in vain.

And now to God, his God and our God, be all the glory!

FUNERAL SERVICES OF DR. COLEMAN.

On Thursday morning, March 16th, our venerable and beloved professor, Dr. Lyman Coleman, quietly and peacefully breathed his last. The funeral exercises were held on the following Saturday afternoon, at which time the faculty, representatives of the undergraduates, together with many alumni and numerous friends of the family, gathered at his late residence on the campus. The services here were brief and simple, consisting of the singing of the hymn, "Nearer, my God, to Thee," by the college choir, the reading of a few passages of Scripture by President Cattell, and prayer by Rev. A. R. Stevenson, pastor of the Brainerd Church. Among the pallbearers, the trustees were represented by Rev. J. H. Mason Knox, D. D.; the faculty, by Professors Coffin and King; the alumni, by Rev. Thomas S. Long, '65, and Rev. John C. Clyde, '66, and the Presbytery, by E. J. Fox, Esq., elder of the Brainerd Church. A procession was then formed and proceeded to the College chapel, where a large number were gathered. The body of the chapel was occupied by the students, the front pews, however, being reserved for the immediate friends, the alumni and the faculty with their families, while the gallery was well filled with strangers.

President Cattell, Dr. Knox, and Professors Porter and Ballard occupied the pulpit.

The College choir rendered the funeral anthem, "Sleep thy last Sleep," by W. O. Perkins. Appropriate portions of Scripture were read, and prayer was offered by Dr. Knox; one of Dr. Coleman's favorite hymns was then sung, commencing, "How blest the righteous when he dies," after which President Cattell spoke.

He commenced his address by referring to the death of Dr. Coleman as only the second that had occurred of a professor in Lafayette College who held, at the time of his death, his position in the faculty. The other was the decease of Prof. James H. Coffin, LL. D., nine years ago. Several points of interest in the character of these two distinguished scholars were traced; both natives of the hills of the Old Bay State, trained in the school of adversity, yet highly educated, eminent for the breadth and thoroughness of their attainments, notable for their sincere and ardent piety, and widely

known for their long and useful careers as educators of many young men. In Lafayette's walls, where so much of their lives was passed and in whose service they ended their days, their memories will ever be cherished with reverence and affection.

Dr. Coleman's life as pastor and teacher was then briefly sketched, also his learned contributions through the press, especially upon biblical subjects, which Dr. Coleman had made a special study and in which he had become an authority among all biblical scholars. The hope was expressed that at some other time a memorial service would be held in the chapel, at which more justice could be done to this subject than in these brief funeral exercises; and he felt sure the audience would join with him in the wish that this duty would be performed by Dr. Coleman's endeared friend, the Rev. Alfred H. Kellogg, who was expected shortly to return from Europe.

In referring to the character of Dr. Coleman, the speaker dwelt upon those traits which had been impressed upon his own mind by the intimate relations he had sustained to the Doctor as his colleague in the faculty for the last eighteen years. Their acquaintance began thirty-five years ago, when Dr. Coleman was professor of German in Princeton College and Dr. Cattell was a member of the senior class. But at Lafayette, where Dr. Coleman had come to occupy the chair of ancient languages, which the speaker had resigned in 1860, he had learned to know Dr. Coleman intimately and he spoke at some length of his rare and unselfish devotion to the interests of the College, of his sympathy with the students, and of the kindness and cordiality which he always extended to the president. Dr. Coleman was not only a great scholar; he was eminently practical and sagacious. Dr. Cattell had frequently sought his advice in the many difficult matters with which he had to deal, and always found him faithful and wise.

His last sickness, extending through nearly sixteen months, was briefly sketched; and during this long and weary period his sufferings were alleviated by the thoughtful, assiduous and loving care of his devoted wife and by the visits and sympathy of his colleagues and friends. It was on Sunday night the last feeble word was spoken. He lay for three days with no other sign of life but his slow, measured breathing, and at ten minutes past two o'clock on Thursday morning, the Christian scholar and beloved professor quietly and peacefully fell asleep in Jesus.

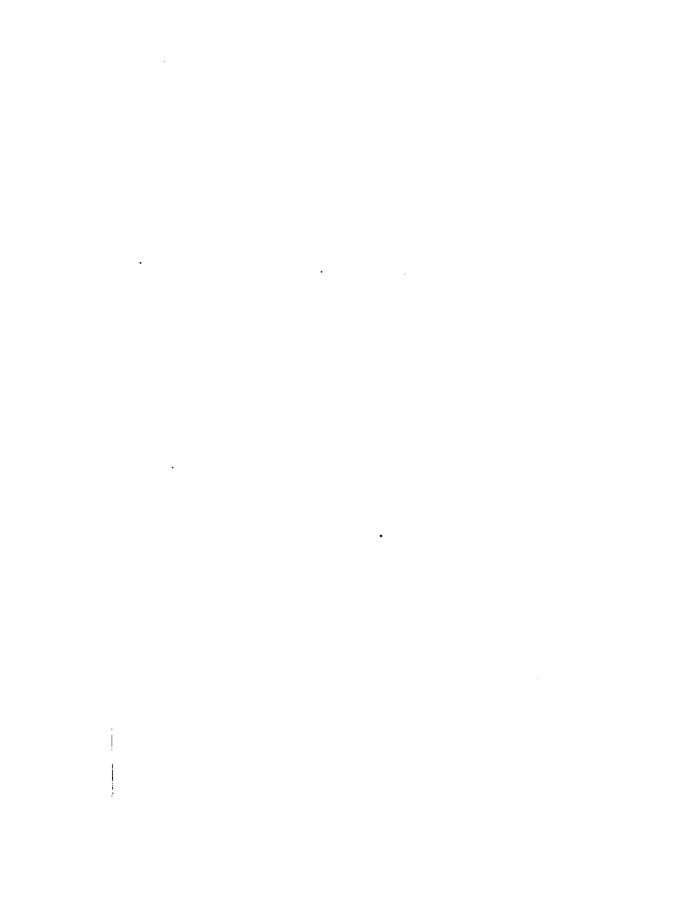
Dr. Ballard then said (in substance):

On the map of Palestine there are certain chief points to which the eye always turns and on which it naturally lingers—Bethlehem, Nazareth, Jerusalem and Capernaum. These are natural centres from which to explore the whole land. It is important that these points be accurately determined, and we are grateful to those whose patient investigation has given us a reliable delineation of the Sacred Country. And for the most trustworthy representation, we are, I believe, indebted to Dr. Coleman. But there is another field in which the explorers are more numerous and in greater need of a safe and sure guide—the field of human life and action. Here it is of transcendent

numerous changes the landscape would undergo from the varying points of view. On the Sunday he spent at the "Glen House," invited to preach, he talked on St. John's account of Jesus and the woman of Samaria, and found in the view from the window of the parlor where he was preaching the exact counterpart of the scene of our Lord's talk as He sat by Jacob's well. We are sure that no one of the promiscuous gathering who heard him that day can ever forget either the description or the lessons he drew. As years and infirmities increased he was obliged to give up, one by one, his college duties, until when his last sickness overtook him, he had limited himself to instruction in Hebrew and Biblical Geography and the chapel preaching in his turn.

He was an excellent Hebrew scholar, wedded to his Hebrew Bible—so much so, indeed, that he never left home, if but for a night, without his Hebrew Psalter, and so fond of it, that for years at family worship, in reading the Old Testament in course, he always read the morning verses from the Hebrew, those of us who followed him with the English version in hand noting the frequent variations, often very instructive, of a literal translation.

Those of us who observed the tokens of age sometimes regretted that he would not earlier consent to retire from active duty, but his own view was that such retirement would induce premature mental decay, and that the only way to keep the mind clear to the end was to work to the end. He could not be idle. Idleness, even when enforced by illness, was torture. Even in the intervals of his last prolonged illness, when able once more to see and to read, his time was filled with reading and reviewing his favorite studies. Playfully, last December, he sent to the speaker, then in London, the message that he was again going through the wilderness with the children of Israel that he had got out of Egypt and was making for Canaan. His thirst for knowledge was insatiable to the very last. He remembered his friends and dictated multitudes of letters to his numerous correspondents. The last letter he dictated was in the latter part of January, written in reference to the death of a



could not kneel, but insisted on standing, leaning on his cane and partly resting on the table. He seemed to be aware of his situation, for he confided himself, as well as all of us, to the keeping of God's Providence, "not knowing," as he said, "how soon the summons home may come." How he praved for the more general sanctification of the Sabbath day! How he prayed for his country (the old man was intensely patriotic), that it might be preserved from an ignoring or forgetfulness, of God! How he prayed for the youth of the land, that they might prove worthy of their traditions and a holier generation than the fathers! We can never forget it, that the last prayer we ever heard him utter was for his country and for the rising generation. He had no petty jealousies of younger men. He rejoiced to see them equipping themselves for the conflict with error, and was ever hoping great things for them. Few instructors have had more sympathy for their pupils. He had himself been schooled in adversity. He knew much of early trials. How often he used to say that "the highest idea of education is to overcome obstacles." Nothing made him happier than to help and encourage young men to meet and overcome their difficulties. He was untiring in watching the development of his pupils and in devising means of stimulating them to greater achievements. They always found in him, in all their troubles, a willing listener and a wise counselor. He died in the early morning of Thursday, March 16th, of the present year, and was buried on Saturday, the 18th of March, in this last home of his that he loved so well.

Years ago, expecting to die, he wished to be buried in his native place, but latterly became content to lie far away from his fathers. And so he lies here, where the savor of his name will long survive, and his tomb be a reminder to the student of coming days of what a life consecrated to God's glory and the service of humanity can accomplish.

This sketch of Dr. Coleman's life-career will show how difficult is the work of characterization; for he was a many-sided man, and possessed of traits that would seem to be opposites, . •

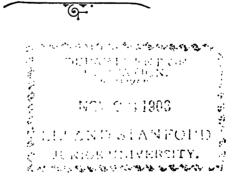


INAUGURAL DISCOURSES,

Lafayette College,

EASTON, PA.

JUNE 24TH, 1884.





Rev. J. H. M. Knox, D. D.,

President.

Sir:—You are respectfully requested to furnish to the Board of Trustees of Lafayette College a copy of your Inaugural Address for publication. It is proposed to publish with your address the other addresses attending your inauguration as President of the College.

Very respectfully,

A. Pardee, President.

FOR THE BOARD OF TRUSTEES.

Mr. A. Pardee,

President of Board of Trustees of Lafayette College.

My Dear Sir:—The address for which you have asked is herewith placed at your disposal.

Yours very truly,

Jas. H. Mason Knox.

DISCOURSES

AT THE

INAUGURATION

OF THE

REV. JAMES H. MASON KNOX, D. D.,

PRESIDENT OF LAFAYETTE COLLEGE,

EASTON, PA.

JUNE 24TH, 1884.

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INTRODUCTION.

BY A. PARDEE, PRESIDENT OF BOARD OF TRUSTEES,

DR. KNOX, DEAR SIR:—It has become my pleasant duty, as President of the Board of Trustees of Lafayette College, to announce officially your unanimous election by the Board to the Presidency of the Institution, and as such to introduce you to the public and to the alumni, faculty, and students of the College. I pledge you, on behalf of the Board, their earnest support and friendly counsel, and ask of the faculty their cordial co-operation with you in the government of the College, of the alumni their help in forwarding its prosperity, and of the students the cheerful obedience, respect, and confidence due to you personally and officially.

You need from me, sir, no words of counsel or admonition as to your course of policy as President, even were I capable of giving them. You have the full confidence of the friends of the Institution and of your associates in its government, and their best wishes that you may long and prosperously fill the office you now assume. And now, sir, I take you by the hand and greet you as President of Lafayette College.

INAUGURAL ADDRESS

BY

REV. JAMES H. MASON KNOX, D. D.

Gentlemen of the Board of Trustes:—I am here this evening formally to assume the Presidency of Lafayette College, to which I have been called by your votes; but not, as I conceive, solely, or even chiefly because of these. A mere election thus would have been declined with great ease. It has, however, been made to appear to me that you were the instrumentality in the hands of Divine Providence to bring me here to attempt the discharge of duties for which I have no ability, excepting as God, whom I serve, shall give it to me. His will I trust I obey in standing in this presence, and in view of the weighty responsibilities of the position I am to occupy, as a hundred times already I have made it, now again my appeal is to Him without whom I can do nothing—"If Thy presence go not with me, carry me not up thence."

This College is no stranger to me. Especially from the time of the second Presidency of him who was its father, I have been familiar with its story. By nearness of residence to Easton, by residence in Easton itself, by intimate personal, ecclesiastical, and official association with those who had charge of its interests, my opportunities have been many to know its struggles and trials in its efforts to make for itself a name and a place among the institutions of learning in our land. I knew, and marked with sentiments of the most profound admiration, the spirit of self-sacrifice with which that heroic man of God, made of the stuff of which martyrs are made, prayed and labored to fulfill by the agency of "lovely Lafayette" the purposes to which, on a bed of sickness which was nigh unto death, he devoted his spared

life, the furnishing of competent men for the gospel ministry. But as he was inspired with this one thing, and gave himself wholly to it, throwing into his work the wonderful force of his personality filled with the Spirit of God, I do not believe the College would have survived any considerable period. That it did live, that it has thriven and become a power in the land, I am assured is because of the foundation in faith and prayer which was laid by Dr. Junkin and the men associated with him in the faculty and in the classes they gathered about them.

He left, and other men faithful and true took his place— Yeomans, Nassau, McLean, McPhail—and under them the College did good work, though hindered by difficulties so great, as seemed time and time again would break it down utterly, and must have done so, but that the old spirit in which it was begun and carried forward in its early day lived and wrought in the hearts and lives of those who in the crises of its affairs were in its management and chairs of instruction. Of these latter one still survives. His name I need not mention. For more than a quarter of a century he has been writing that name in ineffaceable characters in the affections of the youth of as many classes. For as much time and more, if God will, may he be still spared to the College to increase her fame and to enlarge her rightful pride that on her list of instructors she has one to whom, without fear of exciting a jealous feeling anywhere—so meekly does he bear his honors—all award the title, facile princeps.

But, notwithstanding the faith and courage of those men, there came a time in the history of this Institution when its affairs were desperate indeed and the heart of the strongest was ready to fail. This extremity was God's opportunity. By His good Spirit, the look of the Trustees was directed to one who had distinguished himself as a professor, and William C. Cattell was invited to the Presidency. I need not speak of his sagacity, enthu-

siasm, and success. They are known to you. They are known to all men. The record of his devotion to the College is written on every Behold it in these beautified grounds, in these buildings, the Chemical Hall, the Observatory, the Reading-room, the Chapel, the Gymnasium, and this noble Hall of Science in which we are assembled. Behold it in the greatly enlarged course of instruction and in the attendance of students, now counted by hundreds when before there were scarcely as many scores. Behold it in the fact that Lafayette has risen from a condition in which it was well nigh to extinction to her present eminence as a seat of learning. President Cattell did not indeed effect these great changes for the better without help. But they were his words and his earnestness in the work he had in hand which interested you, honored President of the Board of Trustees, and persuaded you to make the best—aye, the most remunerative investment of your life in this splendid structure and the instruction given herein. As with you, so with others who counted it their honor to give of their substance to achieve for this Institution the results in which we rejoice to-night. They too were won by Dr. Cattell to care for Lafayette, and the successes he achieved through the men he so warmly attached to himself, while he made their purses tributary to the College, shall remain evermore the monuments to the intelligent, untiring, and selfdenying services of the man who for twenty years carried its interests in his heart of hearts, to do and suffer for them, and the work of whose hands Almighty God established so firmly.

The strain at last became too great. Our friend was convinced that to continue to endure it longer would be to cast him aside from all hopes of future usefulness, and the Trustees yielded with great regret and sorrow to the necessity of granting his request to be released from his heavy care. And now I am to take up the burden which my dear friend has laid down. From the time when my name was used in connection with this office, I

have not ceased to wonder at what the meaning of it might be. That it should be so used until it was done had not once occurred to me as among the things possible. Is it of God or of men? If it be of God, as I humbly trust it is, and therefore, and only therefore, am I here, then I may have confidence that the College shall receive further tokens of good from Him in whose name and for whose glory it was established, and whose loving kindness hitherto has been so conspicuous in its history.

But the means—and for these we are responsible—by which this Divine favor shall be continued and enlarged, what shall they, what must they be? In the history of the world, and most emphatically in the history of our country, there has been no time when the responsibility was greater upon those who have to do with the instruction of youth in the higher departments of knowledge. In a very short time the young men now gathered in the colleges are to be leaders in the chief spheres of influence in society, they are to control thought and action at the very centres of power. This, indeed, has been true always, but to-day it is a truth demanding a consideration such as it never demanded before. There is a fearful activity nowadays in the human mind, urging it on as with an inflamed impulse, that sometimes threatens to bear down every established landmark of truth and order. We would not if we could check this activity; it is a grand thing, calling for no condemnation, but requiring to be so directed as to make it the means of blessing and not of cursing to the great and varied interests with which it must have to do.

To give this direction is the peculiar work especially of the higher institutions of learning. I know that much is said upon occasions of self-made men, with the intimation that as they are needed—without the aid of educational facilities—the men for the times will be found. In this presence refutation of this ignorant and short-sighted thinking need not be attempted. No

educated man can be true to his advantages and fail to recognize and rejoice in ability achieving success in the lack of advantages personal to itself. However much the individual may be worthy of praise for his triumph over difficulties, the triumph itself is the result of education, and would have been greater or more easily accomplished under the circumstances of its achievement, had the individual been prepared by careful training to avail himself of the work done for him by educated men. None know this better than self-made men themselves, and the proof of their appreciation of their own needs, is seen in the fact that a very large proportion of the noble endowments of educational institutions which have marked these latter years, has been the gift of men who did not enjoy the advantages they so munificently bestowed on others. It is, I think, evident as an axiom that the university, the college, is a necessity in order to the furnishing of competent men without it, as well as within it, to do the work of life in its commanding places. this the prescribed course of study has special adaptation. Not so much because of the knowledge, in the sense of information which it imparts (most important as this is), as for the discipline of mind it secures. The curriculum of former days has been greatly modified, or rather enlarged, by the demands of the present age, but still the end in view has not been changed. college is not and cannot be a school for apprentices who will, immediately on leaving its halls, begin to work at their trades. Nor is it a professional school, to send out its graduates as fully prepared men to engage at once in their chosen life occupations, but it is a disciplinary institution in which to train the mind so that it shall lay hold of and appropriate the learning needful to fit it for the special calling in life, whatever that calling may be. It is this foundation work a college does. The graduate who judges himself to have finished his education when he receives his diploma probably judges rightly concerning himself; but just as probably, in after years, Alma Mater will have no reason to point with pride to him as her son.

But more than intellectual discipline is the result of a college That they may act well their part in life, young men need the four years' confinement to severe, exact, and comprehensive study. They need, besides, the morale which college life is so well adapted to secure to them. They are apt to be confident and willful in their opinions, and therefore need the subduing influence of college law, the singularly republican influences of college society, where the distinction of merit absorbs that of birth and wealth. Besides the study demanded from them, they come into contact in college with nameless and numberless incidents which discipline them into a much more complete manhood. Excrescences of character are worn away by intercourse with professors and senior students and by the experiences of the recitation-room and the platform. The very contact with college walls has an abrading effect which no one can fully analyze. In many particulars he may surpass all other men, but in some particulars a self-taught man must be an untaught man, for he has not been overawed by the authority nor regaled by the reminiscences of those institutions which are both intended and fitted to remind us of the treasures lying hid in the soul.

These are some of the influences—the list might be greatly enlarged and yet the half not be told—which meet and accompany young men who are gathered within the walls of the college. Their power is very great. It behooves trustees and faculties to give to them all the force of which they are capable. The more energy in these influences, the greater the assurance that the men subjected to them will not fall by the way because of temptations to evil; the surer the result that in all their lives they will be able men, equal to tasks demanding skill, wisdom, and character, men quick to discern the true and the right, and to uphold and defend them with an intelligence and integrity of purpose which will

command both respect and obedience. Of merely smart men, the world always has had more than enough. Of men of comprehensive minds, of thorough training, of integrity of heart and high purposes, there can never be an over-supply, nor, as a rule, can they be produced by other means than those which are worked by the higher institutions of learning. Men of strong intellects, men of high probity not thus trained are not few in the various walks of life; but the men to persuade, to reform, to lead, are for the most part those who in their early youth and manhood have been subjected to the discipline of the schools. And if in our day of unrest and stirring movements there is to be order—if law, and not licentiousness, is to govern; if truth and righteousness are to prevail, then has every college a work to do the magnitude and importance of which are beyond the power of speech to tell.

But mere intellectual and social influence will not do this It demands this, but, besides, that which is higher and In order to be the power it should be, the college must be a religious institution, teaching the truth revealed by God in His Word, and having its life permeated by the spirit of the Lord Jesus Christ. It will be of little account to themselves or to society to send forth our young men into the activities of life accomplished linguists, profound mathematicians, subtle metaphysicians, learned and skillful chemists and engineers, if with the discipline and attainments by which they reach these good degrees they have not been instructed in the fear of God, which is the beginning of wisdom. My profound conviction is that a seminary of any sort which does not inculcate the principles of true religion, which does not hold and illustrate in its life and with positiveness, the fundamental doctrines of Christianity, might better not exist. It is true of institutions, as of indiyiduals, that godliness has the promise of the life that now is and of the life that is to come. This is not a matter of opinion or of

prejudice but it is a fact, than which no fact is more capable of demonstration from the pages of history. "It is a stale proverb that 'ignorance is the mother of devotion,' but the true apothegm is that devotion is one parent of knowledge. There is an inherent affinity between science and virtue. God has joined them together, and though man has often put them asunder, yet the disquiet which ensues from their divorce is a sign that nature demands their union. Hence we find that nearly all the universities of the Christian world have been founded by the clergy and for their use. The oldest colleges of our land were for a long time regarded and conducted as schools of the Church." With these incontrovertible statements, Professor Park, of Andover, a generation ago, began an elaborate address on the "Utility of Collegiate and Professional Schools." The time which has passed since they were made has, I think, only demonstrated more abundantly the fact that to do its best work a college must be instinct with the light and life of Christianity. All efforts to have it otherwise, to make it a purely secular institution, are attended with such risks to the best interests of society, are so certain to result in disaster to them, that it is preferable to have no education than to have one that is without God. Of institutions in which the effort is made to carry them forward without religion, and which live and even thrive, is it not true that they cat Christ's bread while they lift up their heels against Him? They are obliged to recognize Him, who is the light of the world, however unwilling they may be to do so. It is the ungracious tribute they pay to Him which is the salt which saves them from corruption of mind and morals. The college on whose foundation-stone is inscribed the motto, Pro Christo et ejus cruce, and whose daily life is inspired with the Spirit of Him who came not to be ministered unto but to minister, and who gave His life a ransom for many, is the college, other things being equal, which will exert the best, the highest, and the most

permanent influence on those whom it instructs, and through them on society and the world. This is true, as it is also true that the community or the State which holds most tenaciously and most fully to the doctrines of religion that are known as Evangelical will demand and sustain institutions of learning of a high order; in other words, in proportion to the depth of religious conviction are mental activity and the call for the necessary appliances for intellectual cultivation. To quote that great light of the University of Dublin, William Archer Butler: "As all knowledge is mainly valuable as it helps our efforts for the last and mightiest knowledge of ourselves and God, so when this is attained, through virtue of the Christian truth, it, in its turn, radiates back upon all the departments of knowledge a new and blessed light. And thus the revelation of Christ not merely teaches us in itself a series of truths of inexpressible importance, and without it wholly unattainable, but it also, as a great central discovery, harmonizes all our beliefs, sacred and secular, binds them together as its own servants, gives them a new interest and position and coloring, and dignifies the pursuit of them as a labor in the very cause of God Himself, for to know the beauty of the temple is to know the glory of the architect. And hence so far are we who advocate the Revelation of Christ as the basis of education, from restricting or dreading the free search of natural knowledge, that, on the contrary, when once the cornerstone has been fixed in our foundation, we hail every bright discovery as a new tribute to the creating and redeeming God whom we adore." Some statistics which have fallen very recently under my observation are in place here as illustrating in actual fact the relation between faith and culture. they. In England, with a population of 25,000,000, there are 5,000 students in the colleges and universities, or one student for each 5,000 of population. In Germany, in a population of 48,000,000, there are 22,500 students, or one student for each

2,134 of population. In our New England States, in a population of 4,110,000, there are 4,000 students, or one student for each 1,028 of population. In Scotland, in a population of 4,000,000, there are 6,500 students, or one student for each 616 of population. These figures go far to establish the proposition that piety and education go hand in hand, for I suppose it is not doubted that Scotland is foremost of nations in intelligent devotion to the truths and principles taught in the Scripture, and, as it appears, it is also foremost in providing students to the more advanced seminaries of learning; and Scotland's sons in the blood or in the faith have been among the most zealous in the establishment and support of schools and colleges in this Western land, and these institutions, thus founded and supplied, have contributed in largest number the men of fibre to elucidate, uphold, and defend against all opposers the principles of truth and liberty which are its glory. Certainly it is so, that religion and true learning are married, and to disturb the intimacy of their relations is an act of violence which in the Providence of that God who has both pronounced and blessed the banns cannot go unpunished.

Gentlemen of the Board of Trustees, I know that the sentiments I have expressed are your convictions. Association with you for many years in counsel and effort and prayer for this College, which by every endeavor has become more endeared to you, allows me to entertain no doubt of your faith, that, except the Lord build the house, they labor in vain that build it. Your works, your liberal and continuous benefactions, show your zeal for every department of literary and scientific culture, but in this, from first to last, your aim has been to make the College show forth more and more the praise of God, the Father of Lights, and of His Son Jesus Christ, the Light of the World. This has been the genius of this College from the beginning of its history to the present hour. The banner inscribed to the

glory of God flung to the breeze in the early days of its existence, to this moment has never been furled, nor has its lustre been permitted to become less. Receiving it thus from the hands of the honored men who have preceded me in this high office, here and now, in humble dependence on the grace I need so much, and for which I pray most carnestly, I promise that it shall be kept still aloft and its colors shall not fade. That, in fulfilling this purpose and pledge I shall have your carnest sympathy and help, I need no greater assurance than the record you have already made of faithfulness in your trust. It is a matter of most profound gratitude, and, next to God, my chiefest strength, that you, gentlemen, so long my companions, and who have been thoroughly tried and not found wanting, are the custodians of these precious interests over which I am called to preside.

GENTLEMEN OF THE FACULTY:—You have given me already a most cordial welcome, for which you have my heartfelt thanks. You are not strangers to me, either personally or by the reputation you have carned as instructors, and I am assured in advance of your earnest co-operation with me in whatever gives good promise of benefiting this College, which commands so thoroughly your affection and duty. Lafayette has had a remarkable history in the devotion of her teachers. They have loved her and given themselves to her with a self-abnegation that I must regard as well nigh-unparalleled.

This spirit lives in you, gentlemen of the Faculty of to-day. It burns even with fervor, and what in you lies to exalt the fame of the College, that you do earnestly, heartily, not as pleasing men, but as pleasing God. I speak that which I do know and testify to what I have seen. My brethren—so let me call you, and so let me regard you; the work devolved upon you and me justifies the highest degree of enthusiasm. A college deserves the

name of Christian only when it is pervaded by the Spirit of Him who said, "My meat is to do the will of Him who sent me, and to finish His work." His work here and for us is to produce thorough scholarship conjoined with the truest manliness of character. The former without the latter is of little worth. To do these things with the young men in our care is to do a work for them, and through them for the country and for the world, the measures of which baffle computation. It demands entire consecration of every power of mind and heart. Its reward will compensate the effort and the toil infinitely. I know well that in thus speaking I have your consent and approbation, and that in every endeavor to enlarge the well-earned fame of the College and make it more than ever a power for God and man, I shall have your steadfast and most resolute help. Gentlemen, thus assured, with unfeigned pleasure I take my place as President of the Faculty.

TO THE ALUMNI I may be allowed to speak a word. You are the sons of Alma Mater, no longer under tutors and governors, but of full age, from whom she expects and should have the most affectionate attention and constant tokens of devoted regard. I have no reason to doubt that you recognize the claim which Lafayette has upon you for whatever service you can render to strengthen and enlarge her usefulness. present is the time of your opportunity to manifest your sense of duty to the College which in the time of your need gave to you so freely of her treasures. The foundations for a future prosperity, exceeding far anything to which she has attained hitherto, are laid broad and deep, and it needs only the resolve, and the act according with the resolve, on the part of each alumnus to do for her as God has given ability, to make that most attractive prospect an immediate possession. children do their part in this behalf, and the time, the set time, to favor this College will have come.

FRIENDS OF LAFAYETTE:-It is written, it is good for a man to bear the yoke in his youth. The saying is just as true of an institution as of a man. As a man who has come into prosperity after struggling with the hardships of adversity has a fibre which can be produced only by such experience, as he is possessed of a stronger character, of sympathies and abilities which otherwise he could not have had, so is it with an institution of benevolence or of learning. It is good for it to have a history making directly for its power and usefulness, written in the sears of struggling, the tremblings, the fears, the disappointments, in, through, and by which it has become able to accomplish the greatest things. This ability can be had in no other way. I do not then regard it as other than a blessing to Lafayette that in these fifty years and more of her existence she has had a great fight of afflictions, that she has had to contend from the beginning with insufficient pecuniary means, that such men as McCartney and Coleman and Coffin and others who might be named have not counted their lives dear to them if only the College might do good work for God and man; that by such devotion, which only such moral heroes could show, she has lived and sent forth her graduates, now numbering a thousand, into all lands, and on errands of uplifting power in every department of commanding influence. She has done this thing, and she has done it well, and by doing it she has earned—I speak the word in all modesty yet with strong conviction—the right to live not only, but to be lifted into a condition of prosperity such as by her past experiences she has been fitted to use rightly. Lafayette has borne the voke in her youth. Is she not now of such age that with safety, with assurance, the dear College, which men of whom the world was not worthy have carried on their hearts as their treasure, which they must defend and save at whatever cost, may enter upon her inheritance? What say you, friends, who have already done so well in laying the magnificent foundations here? And what say you, friends, who have been almost persuaded to join the others and to erect the superstructure on this magnificent foundation? Is not this the time to give completeness to your half-formed resolutions? The work that waits to be done shall be done. Lafayette will have an endowment commensurate with her Halls. But whose shall be the praise as the agents of Him whose are the silver and the gold and the cattle upon a thousand hills? The faith which was the gift of the Holy Ghost, which here planted this Institution, as beautiful for situation as was Jerusalem of old; the faith which has labored on till this time, receiving continual tokens that it is of God—shall not, cannot be disappointed, for He is faithful who has promised. But who shall be His servants to fulfill the promise? Will not you, beloved friends, who to-night gather here to bid God speed to him who is here only because he believes that God is, as He has been, with Lafavette, and that He will help her, and that right early?

And now, our prayer to Him who heareth prayer, is, the Work of our hands, establish Thou it; yea, the work of our hands, establish Thou it. With a diffidence so great that I cannot tell it, yet with a confidence so great I cannot define it, for I do not understand it, but believe it to be of God, I take up this great work. If I am rightly here, then it shall prosper in my hands; if I am not here rightly, then it shall prosper in the hands of others, for prosper it shall—the mouth of the Lord hath spoken it. Ye that make mention of the Lord, pray for me.

FACULTY WELCOME

BY PROFESSOR ADDISON BALLARD, D. D.

Dr. Knox:—Having been unanimously and cordially invited by the Trustees to the Presidency of this College, they have now completed their action by formally inducting you into your high office.

By request of the faculty, I now extend to you in their behalf a like unanimous and a like cordial welcome.

Had you, before your election, been an utter stranger to the College and to us, we should still have given you this friendly greeting, as a proper mark of our respect for the decision of the Board and of our confidence in the wisdom of its choice.

But you have not come a stranger to the College. contrary, you have been intimately acquainted with it for many years. As a trustee, you have rendered it long, faithful, and valuable service. Its methods of discipline and of instruction will not, therefore, be experiments with you. Indeed, I congratulate you that in some important particulars respecting which some of our colleges seem to be in the throes of an anxious discussion, we have here passed beyond the stage of experiment into that of permanent and successful operation. From this, our advanced position, we look back sympathetically and see some of our older institutions still wrestling with their new theories of educational reform. In order, for example, to soothe the impatience under discipline of the modern American student it has been proposed in some quarters to admit him to a joint control with the faculty in the government of the College. But our own officers and students have so long been on

the footing of a mutually good understanding that such a change is quite unnecessary here. Again, the magazines of the country are just now bristling with sharp discussions of the question, "In what does a liberal education really consist?" One distinguished educator inquires earnestly how the English can be elevated in our colleges to a larger share of instruction and study. But had our eminent New England inquirer only condescended to come a little further south before asking his questions, our own Anglo-Saxon Columbus would have been most happy to show him how some twenty odd years ago he himself stood that unsteady philological egg on the broad table of his already historic class-room. And we could also show how this increased attention to the English has not yet so interfered with the study of the Greek or Latin as to make it impossible longer to find a student in the classics who can write a "good Latin salutatory."

The completed college education represented by the diplomas which it will be part of your duty to bestow is the joint result of the work of many instructors in many different departments. We welcome you because, from what we have seen, we are assured that each one of these departments will have your hearty encouragement, and, to the extent of the means at your command, your practical support; that you will be glad to see each man make the most of his department and of himself in it; and that you will heartily rejoice in the success of the endeavors of any of your colleagues to add in any way to the real efficiency and to the honorable reputation of the College; that, in short, you will regard that as the highest and truest harmony which best combines the unhindered and full power of the individual parts.

But more especially do we welcome you because we know that you are in perfect accord with the founders and their successors in the purpose here to imbue a sound scholarship with a thoroughly Christian spirit; because you regard the College as a means for advancing a divine spiritual kingdom among men; because you believe that the Bible is the only efficient instrument for the promotion of that end; and because, therefore, no departure need be feared under your administration from our traditional study of the Bible, as being in its entirety the revealed word of God.

Times of transition are necessarily to some extent times of suspense and of anxiety. But I believe that I voice the sentiment of my colleagues when I say that with us that time of suspense is already passed. Your letter of acceptance, in October last, and the spirit of your baccalaureate on last Sunday morning, convince us that you have sought and have received a higher than human wisdom in the acceptance of this new post of duty. From the well-earned and honorable successes of those who have preceded you, we look, therefore, to see the College pass on to such larger and nobler results as will gladden the hearts of the lovers of sound Christian education, and as will justify to all the friends of the College the wisdom of your appointment.

Be assured then, Dr. Knox, that in the discharge of your many difficult and responsible duties you will have our hearty and our carnest co-operation. In behalf of my colleagues, I give you more than words of formal and official greeting, I give you the hand of sincere and affectionate welcome.

And now, pleasant as it has been to me to give this welcome to President Knox, I have another agreeable part to do, and I trust that the audience will bear with me while I do it, though it is not down on the programme. I had thought that we might have with us this evening, and that you might have with you to-morrow, one whom we all honor as a generous and steadfast friend of Lafayette College. I mean the Hon. John I. Blair, of Blairstown, N. J. During an interview which I had with him yesterday afternoon, he desired me to express to the President and Trustees, and to all who are gathered here, his

just as probably, in after years, Alma Mater will have no reason to point with pride to him as her son.

But more than intellectual discipline is the result of a college That they may act well their part in life, young men need the four years' confinement to severe, exact, and comprehensive study. They need, besides, the morale which college life is so well adapted to secure to them. They are apt to be confident and willful in their opinions, and therefore need the subduing influence of college law, the singularly republican influences of college society, where the distinction of merit absorbs that of birth and wealth. Besides the study demanded from them, they come into contact in college with nameless and numberless incidents which discipline them into a much more complete manhood. Excrescences of character are worn away by intercourse with professors and senior students and by the experiences of the recitation-room and the platform. The very contact with college walls has an abrading effect which no one can fully analyze. In many particulars he may surpass all other men, but in some particulars a self-taught man must be an untaught man, for he has not been overawed by the authority nor regaled by the reminiscences of those institutions which are both intended and fitted to remind us of the treasures lying hid in the soul.

These are some of the influences—the list might be greatly enlarged and yet the half not be told—which meet and accompany young men who are gathered within the walls of the college. Their power is very great. It behooves trustees and faculties to give to them all the force of which they are capable. The more energy in these influences, the greater the assurance that the men subjected to them will not fall by the way because of temptations to evil; the surer the result that in all their lives they will be able men, equal to tasks demanding skill, wisdom, and character, men quick to discern the true and the right, and to uphold and defend them with an intelligence and integrity of purpose which will

command both respect and obedience. Of merely smart men, the world always has had more than enough. Of men of comprehensive minds, of thorough training, of integrity of heart and high purposes, there can never be an over-supply, nor, as a rule, can they be produced by other means than those which are worked by the higher institutions of learning. Men of strong intellects, men of high probity not thus trained are not few in the various walks of life; but the men to persuade, to reform, to lead, are for the most part those who in their early youth and manhood have been subjected to the discipline of the schools. And if in our day of unrest and stirring movements there is to be order—if law, and not licentiousness, is to govern; if truth and righteousness are to prevail, then has every college a work to do the magnitude and importance of which are beyond the power of speech to tell.

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ALUMNI GREETING.

By Hon. R. E. James.

Dr. Knox, President of Alumni Association:-You have had tendered you the assistance of the muscle of the College, the strong arm and steady hand that puts the machinery in motion and furnishes the supplies; the motive power, as represented by the Trustees. You have received words of welcome from the brain of the College, the body that by its eminence in learning and devotion to education's cause reflects honor upon the institution it serves and prepares the way for the men of the future. It remains for me, as the representative of Lafayette Alumni, to tender you the heart of our College, the strong affections, earnest hopes, and unwavering loyalty of her sons. Her history is the sum of the leaflets taken from the books of their lives, and their lives are the more potent for good because she existed, and existed for them. Philanthropy may vary the objects of its bounty, zeal to instruct may find a myriad of fields for its labors, but affection follows only the specific object of its love.

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Ario Pardee

· Memorial Address



Delivered Founder's Day At Lafayette College . . . October Twenty-Third, 1892 . . .



By William C. Cattell, D.D., TT.B.

• Ex-President of the College



DEPARTMENT OF EDUCATION. RECEIVED

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LELAND STANFORD
JUNIOR UNIVERSITY.

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regret at not being able, through bodily indisposition, to be with us during these commencement exercises. It will be remembered that a few years since Mr. Blair endowed the President's chair in the large sum of forty thousand dollars. In the interview which I had with him on yesterday afternoon, I suggested to him that the house now occupied by the President was rather too small for so large a chair, and as Mr. Blair is not a man to do things by halves, he generously consented to make the proportion between the chair and the house more nearly as it should be. He therefore kindly sends by me this message: "That he gives to the College the sum of fifteen thousand dollars with which to purchase Dr. Cattell's house and lot for the President's house." This commodious and elegant residence will thus form another link by which the life and work of our new President will be joined to the life and work of his honored predecessor.

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Ario Pardee

Born November 19, 1810 Died March 26, 1892



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MEMORIAL ADDRESS

Delivered at

LAFAYETTE COLLEGE

FOUNDER'S DAY, OCTOBER TWENTY-THIRD, 1892

Ву

WILLIAM C. CATTELL, D.D., LL.D.

Ex-President of the College

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INTRODUCTORY

BY

ETHELBERT D. WARFIELD, LL.D., PRESIDENT OF LAFAYETTE COLLEGE.

The first step in the founding of Lafayette College was taken on the evening of December 27, 1824, when a small company of earnest and patriotic men met in the little hotel which then stood upon the northeast corner of the public square in Easton. They were men of promptitude in action and at once fixed upon a plan. and gave to the College of their expectation that name which, now borne by the College of our affection, seems so fitting and so full of the inspiration of unselfish devotion. A charter was speedily secured and the Hon. James Madison Porter, LL. D., became the president of the first Board of Trustees. But, though there was a purpose and a plan, for a long time the hand was lacking which should realize them. At last the Trustees found the man they sought, and in the providence of God the Rev. George Junkin, D. D., laid the foundations of this institution. On the 9th day of May, 1832, the college began its work on the south bank of the Lehigh River. A more suitable site was shortly afterwards secured on the present campus, and in June, 1833, the ground was broken for the first permanent building.

Years of struggle followed the inauguration of the first founder's work. Years of hope and discouragement, years of self-sacrifice and hard earned successes. At last in the dark days of the Rebellion the college seemed on the point of failure. Then it was that the Trustees calling to their aid the Rev. Wm. C. Cattell, found in him the second founder of the college. By God's grace he brought success out of discouragement, revived the hopes, and re-established the confidence of the community. He was surrounded by devoted men in the faculty and won to his aid assistance

from many till then unknown, but henceforth to be remembered as long as these walls abide. First among these was he whose memory we to-day are met to honor—Ario Pardee, Esq., the founder of the Scientific Department, the princely giver, the wise counselor, the faithful head of the Board of Trustees.

Dr. Cattell has been invited to recall to-day not merely the man who gave so nobly of all he possessed, and of all he was, to the college, but also those events so critical and so fortunate in which they were fellow laborers. He has been asked to lay aside all reserve and tell the story of the awakening of Mr. Pardee's interest in the college, of its growth and final fruitage, and of its mellow fullness; to tell all this that we who are entered into these seats may appreciate all that was accomplished in the twenty years of fellow service. In 1863 only a part of old South College crowned this glorious hill; in 1883 these grounds were already substantially what we now behold them. It is well for us to remember these days of struggle and triumph. Well, that we may honor the men who did so much for Lafayette College, well that we may learn to emulate and imitate the noble spirit which was theirs.

It now gives me great pleasure to present to you the Rev. Wm. C. Cattell, D.D., LL.D., Ex-president of Lafayette College, whom we may well name with Junkin and Pardee among the founders of the college.

MEMORIAL ADDRESS

R.

WILLIAM C. CATTELL, D.D., LL.D.,

Ex-PRESIDENT OF LAFAYETTE COLLEGE.

Eighteen years ago, October 20, 1874, the following action was taken by the Faculty of Lafayette College and ordered to be placed upon its records for all the generations of Lafayette:

Resolved, That to-morrow, the twenty-first day of October, being the first anniversary of the formal opening and dedication of Pardee Hall, the usual lectures and recitations be suspended, and the day marked by appropriate exercises; and that hereafter the Wednesday following the twenty-first day of October in each year be recognized as the anniversary of the founding and gift of Pardee Hall, and that it be set apart forever by Lafayette College, its Faculty and students, under the name of Founder's Day, as a commemoration of the founder, ARIO PARDEE.

During all these intervening years, at each recurring "anniversary of the formal opening and dedication of Pardee Hall," the Faculty and students of Lafayette College have, as one of the "appropriate exercises" of the day, assembled in this spacious and beautiful Auditorium to listen to an address. On these occasions, members of the Faculty and other eminent men have discussed such topics in Literature or in Science as are befitting the thoughtful attention of a company of Christian scholars.

But during the past year the great benefactor of the College has been borne to his honored grave, and the Faculty have fittingly directed that what is said on this Founder's Day shall be said of him, especially of what he was to Lafayette. To be sure, in every address upon Founder's Day there have been appropriate and grateful references to his munificent gifts, which have rendered possible the great work at Lafayette in the wide reach of its Scientific and Technical Courses. But the generations of student life come and go; there are now upon the roll of the College the children of those who were undergraduates when Mr. Pardee first gave to the College the forward movement which has resulted in the Lafayette

of to-day; many of his associates in the Board of Trustees and many of the honored members of the Faculty, who were witnesses of his timely and munificent aid, have passed away; and although the name of Ario Pardee will ever be a household word with the Alumni and all other lovers of Lafayette, yet something more than detached and fragmentary references to him is needed, in order that the memory of what he really was and of what he really did for the College may not become dimmed in the fast receding years.

The Faculty therefore, judging this Founder's Day to be a fitting time for a memorial address, have invited one to be the speaker who during the time of Mr. Pardee's great work for the College was in very close official relations with him, and whom Mr. Pardee honored with his personal friendship for so many years; and after what your honored President in his introduction this morning has been so kind to say I need offer no apology to you for introducing my own personality in what I shall say of Mr. Pardee, nor need I apologize to the older members of the Faculty if I repeat what may be familiar to them, for the benefit of the younger members of my audience.

But before I speak of the happy day when Mr. Pardee first became interested in the College we all so much love, let me give you, in a brief statement, some facts of general interest in his life.

Ario Pardee was born in the town of Chatham, Columbia County, New York, November 19, 1810. He has told me, however, that his earliest recollections were of his father's farm in Stephentown, near New Lebanon Springs, Rensselaer County, New York, where he led the usual life of a farmer's boy until his twentieth year. In a letter to me Mr. Pardee once said:

My education was limited to what I learned at my father's fireside and the ordinary district school; though, fortunately, I had for a time the advantage of an excellent teacher in the Rev. Moses Hunter, a Presbyterian clergyman who, to eke out a scanty salary, taught our district school two winters. I was then fifteen years old, and his teaching about finished my school education, though I was an industrious worker at my books at home.

In June, 1830, Mr. Edwin A. Douglas, who, as a fellow townsman, had known Mr. Pardee from childhood, offered him the position of rodman in the engineer corps of the Delaware and Raritan Canal, in New Jersey. Mr. Pardee often referred to the reception of this letter, the turning point of his life. He was out in the field plowing when it was brought to him from the house. He stopped his work long enough to assure himself that the letter summoned him from his boyhood's home, to go out into the wide world to begin

a career for himself among strangers; then, with characteristic fidelity to the duty in hand, he resumed and finished his days' work. This was on Saturday. Before daylight on the following Monday he set out from home, joining Mr. Douglas and corps on the preliminary survey of the canal, a few miles from Trenton. With him and Mr. Canvass White, the chief engineer of the canal company, he remained until the canal was fully located, when he was stationed first at Princeton with Mr. George T. Olmstead, who had charge of the middle division of the canal, and then with Mr. Ashbel Welsh at Lambertville. In May, 1832, still under Mr. Douglas and Mr. White, he was transferred to Pennsylvania to make the survey and location of the Beaver Meadow Railroad from the mines of that company to the Lehigh Canal at Mauch Chunk. The young rodman had by this time exhibited to his employers those sterling traits of character which his whole life afterwards exemplified—untiring industry, a sound judgment, good practical common sense and an unswerving fidelity to duty; and though without the advantage of special training in technical schools, indeed with only the very meagre common school education to which his letter refers, he was soon advanced to the front, and the entire charge of the work upon the Beaver Meadow road was entrusted to him. This was before he had reached his twenty-fifth year. His removal to Hazleton shall be told in his own words; I quote from a letter of his written to me many years ago:

In the Fall of 1836 the road was finished and the shipment of coal commenced. I then resigned my position, and after visiting my parents who had moved to Michigan, I took up my quarters in the month of February, 1837, at Hazleton, having previously located a railroad from the Hazleton coal mines to the Beaver Meadow railroad at Weatherly. We finished that road and commenced shipping coal in the Spring of 1838, and I continued in the employ of the Hazleton Railroad and Coal Company as their superintendent until 1840, when I commenced business in Hazleton as a coal operator, which I have continued up to this time.

In addition to his growing business as a coal operator, Mr. Pardee took in hand, one after another, great business interests in other parts of this State and in other States, and in Canada as well—adding to his wealth year by year, until through his well-directed and untiring energy, his enterprise, his business sagacity, joined with rare administrative ability, there came to him a fortune which, though he always said it was largely over-estimated by the public, was yet a fortune of which, when following the plow upon his father's farm, he had little dreamed.

He continued to reside in Hazleton from 1840 until his death, which occurred in the early Spring of this year, while he was on a visit to Florida. There, after a brief and painless illness, tenderly ministered to by his devoted wife and the two daughters who, with his family physician, accompanied him, he peacefully breathed his last.

It was in the Fall of 1864 when Mr. Pardee, then in his fiftyfourth year, had his attention first called to Lafayette College. It was perhaps at the most discouraging period in the history of the College; I say the most discouraging, and this means a great deal, for Lafayette, like all colleges in their early history, had a prolonged struggle with adversity. More than once its very existence hung upon a slender thread-in 1849 and again in 1851 its graduating class numbered only three! Its Founder and first President, Dr. George Junkin, was a man of great endowments, mental and moral, and he was a marvel of devotion to the College. Associated with him in the Faculty were eminent scholars and teachers, and from its comparatively small number of students the College sent forth men who made their mark in the world. But the College was always hampered in its work by the lack of means and other adverse influences. From 1832, when the first classes were formed, to 1863, when the scholarly and devoted McPhail retired from the Presidency, there were (including Dr. Junkin's two terms) no less than six administrations—each President struggling for an average of five years and then, worn out and disheartened, abandoning the almost hopeless work to another. Under the last two of these Presidents I myself served as a professor, and I well know of their heroic but ineffectual struggles to establish the College upon a firm and secure foundation. When Dr. McPhail resigned the country was in the throes of the Civil War; and so little breath was left in the College that in 1863 the Annual Commencement was altogether omitted, and a meeting of the Trustees was called "to consider the propriety of suspending operations under increasing embarrassments."

I was elected President of the College in October, 1863, and resigning my happy pastoral charge at Harrisburg, immediately entered upon the duties of the office. My inauguration took place during the following Commencement, and the new College year began in September, 1864, with a Freshman class of six—increased to ten before the year closed.

Of course, the financial problem confronted us at every turn. The whole amount of the salaries paid to the professors was \$4900, and the income of the College was not quite \$3200; naturally, the College was in debt, and it was generally agreed that unless the

prodigious sum, as it seemed to us in those days, of \$30,000 was secured within a year, the Board of Trustees would have to consider, not the "propriety" but the necessity of suspending operations. To emphasize still further the importance of securing this great sum, let me add that a gentleman in New York had promised, if it should be secured within a year, to pay the entire debt of the College.

At this crisis in the history of Lafayette Mr. Pardee appeared upon the scene. But it was not until more than eleven months of the year had passed—months, I can assure you, of anxious and exhausting toil on the part of the new President, and with only one-third of the sum needed to save the College actually secured.

It was towards the close of the year that I sought an interview with Mr. Pardee, of whom I knew but little beyond the fact that he resided at Hazelton, was a prosperous man of business and a regular attendant upon the Presbyterian Church. The pulpit was vacant, and I occupied it upon a Sabbath in September 1864, and was the guest of Mr. Pardee. During the Sabbath day little was said about the College, but enough for me to learn that Mr. Pardee scarcely knew of its existence; in fact, he told me that he had never been in Easton, except to spend occasionally a night there at some hostelry in the old stage times, when the passengers to New York and Philadelphia from the mining region were accustomed to break their journey for the night at Easton.

But on Monday, as we walked to and fro in the beautiful and spacious grounds which surrounded his mansion, Mr. Pardee, busy man as he was, courteously gave me an opportunity to discuss with him the whole subject. He listened patiently and attentively as I told him the story of the College, its long-continued and heroic struggles to carry on its work, and its present specially embarrassed condition which made its future seem almost hopeless. But to all this his reply was characteristic of a man who, immersed in business, had thought but little of liberal studies and of the aim and object which a college education has in view. "Why don't you throw it up," said he, "if it doesn't pay? That's what we do when we strike a vein of coal that doesn't pay us to work." Of course, this led to an attempt on my part to show him that a college was carried on with a very different object in view from that in working a coal mine, or in carrying on any business operation where the return looked for is pecuniary gain; that every college in the country was more or less an eleemosynary institution—even at Yale and Harvard and Princeton, where there was the largest number of students, the tuition fees never fully paid the salaries of

the professors; that while in Germany and other countries on the continent of Europ?, college and university studies were included in the education provided by the Government, in this country, although a common school education was afforded to all by the State, the pursuit of liberal studies would be limited mainly to the sons of rich men, unless generous gifts for the support of professors in colleges and universities should be made by those whom God had blessed with wealth and the disposition to use it for the benefit of their fellow men, and, I added, "such a man I take you to be."

The minutest incident of that hour is deeply graven on my memory. I can recall now, with the distinctness with which I recall the events of yesterday, that Mr. Pardee, after several minutes of silence, said: "Yes; I see. I thought you had come to Hazleton to preach; but you came here to ask me for money to carry on a college. I would really like to know how much you expected to get from a plain business man like me." Had anyone assured me when I left home for Hazleton to talk about Lafayette College with a rich man whom I had never before met, that he would have given me a thousand dollars, or even five hundred, a jubilate would have broken from my lips! But God put it in my heart then and there to say: "Mr. Pardee, I trust you will give us twenty thousand dollars"—though I added, as he looked fixedly in my face: "This is a great sum of money even for a rich man like you to give, and you know nothing of our great work and of our great need, except what I have told you to-day. Come to Easton; look over the whole ground for yourself; talk with the professors at their homes -and then decide."

Without a moment's hesitation he said: "No; I understand it all now as well as if I should come to Easton. I will give you the twenty thousand dollars now."

He turned away abruptly and entered the house; and while I stood in a sort of daze—wondering if I had rightly understood him or whether, indeed, it was not all a delicious dream—he returned and placed in my hand his note for twenty thousand dollars payable in six months, with his check for six hundred dollars as the interest; then bidding me good morning, he hastened to his office, while I stood, more dazed than ever, but grasping tighter and tighter the twenty thousand dollars I held in my hand.

How I reached the cars, or how I got home, whether in the body or out of the body, I can hardly tell. But I know that the delectable mountains were all round about me that day—for the

thirty thousand dollars were now secured, the debt would be paid, and the College was saved!

And I remember that I reached Easton in the early evening of the same day, and that at the door of my residence (then on Fourth street) stood one to welcome me home, whose gentle and loving sympathy in my work had cheered and strengthened me during the disheartening toil of long, weary months. Again and again had I returned home, after days and sometimes weeks of absence, to say to her: "No; not one person has given or promised me a dollar for the College." And even as the year drew to its close with so little accomplished, it was she who always had the brave heart and the cheerful look, and it was she who always inspired me with hope, as I went forth again to plead for the College. When I took leave of her on Saturday morning she had said, "I cannot but believe that the gentleman in Hazleton, whom you are going to see, will give you something for the College." On my way home I had met with several friends, but not to any one of them did I tell what "the gentleman in Hazleton" had given me, or speak of the joy with which my heart was so throbbing that it seemed as if it would burst. No; it was to her I should first tell it; and a score of times had I put together the very words in which I would announce it. But when I stood face to face with her not a word could I speak! I just looked at her, and I think she feared another disappointment and rebuff had been too much for me and that I had gone clean daft. But at last I managed to say: "There, read that," as I put Mr. Pardee's note in her hand. All the brave words I had so carefully put together, in which to make the announcement of this munificent gift dwindled to just these three! She hurriedly read the note and then looked wonderingly at me for a moment; once more she read it, and looking again at me, but with eyes now dimmed with tears of emotion, she said: "What does this mean?"—but I must not dwell upon the scene that followed when I told her what it really meant; that it was a gift of twenty thousand dollars and that the College was saved!

Another sacred memory comes to me of that day, when later in the evening I climbed College Hill, and entered the room in Old South, where the Faculty were holding their weekly meeting. Many a time had I come back to them too with the story of my disappointment and discouragement. Now and then indeed at these meetings (for I always planned to attend them) I could tell my colleagues of some success—the fifty dollars I had received from one man, or a hundred from another; but mainly it was the same old story,

and they knew that the year in which the \$30,000 was to be secured was drawing to a close, with only ten thousand in sight. For weeks I had brought to them no cheering word, and I must leave you to judge of the effect produced by Mr. Pardee's note which, without a word of explanation, and struggling to conceal the emotion which thrilled every nerve of my body, I handed the clerk to read. Only this I will add: there was an unbroken silence for several minutes. It seemed as though no word could be spoken by us to each other. At last the profound and solemn silence was broken by the voice of prayer. The venerable Dr. Coleman, who when the clerk read Mr. Pardee's note had bowed his head on the table, rose to his feet, lifted his hands towards Heaven, and with a voice tremulous with emotion, invoked God's blessing on the donor. Then we all turned away, each to his home, without another word.

I have purposely dwelt upon this first great donation to Lafayette College, made at a most critical period in its history, not only because it was the beginning of the new Lafayette, but because it was for those days a very large sum to be given to any college. The era of munificent gifts for educational purposes had not yet dawned.

Had Mr. Pardee given me \$50 or \$500, I have no doubt that it would have been a purpose of mine to seize some favorable opportunity, as my work went on, to again ask him for help. But so overwhelmingly munificent was his donation, the largest for any educational purpose which had ever been made in Pennsylvania. that at the time I had no thought of ever appealing to Mr. Pardee again. I did not know indeed that I should again look upon his face. He had told me that it was not likely he should come to Easton, and, as I had nothing to call me to Hazleton, it seemed very improbable that we should ever meet. Yet, as the weeks and months wore on, and the effect of his gift was seen in the awakened interest of the friends of the College, inspiring them with hope and confidence, and stimulating them to new exertions in its behalf, so that its success seemed now assured, you can perhaps imagine how Mr. Pardee was, in the homely phrase, "though lost to sight, to memory dear." In fact, he came to occupy in my thoughts very much the same position I imagine the patron saint occupies in the thoughts of the devout Catholic, who does not doubt he has been saved by him from shipwreck! I longed to see Mr. Pardee once more. Believe me, it was not with the thought of further enlisting him on behalf of the College. I simply wanted to look again on one, who appeared to me as in a beatific vision on

that memorable day. I never entered a railroad car, but I looked around, hoping that he might be there. I had no definite purpose of even speaking to him, least of all about the College. I should have been satisfied to take a seat where, unobserved by him, I could look upon his face. One evening during the following winter at the Girard House in Philadelphia, a friend casually mentioned that Mr. Pardee was at the Continental Hotel, and was to leave at 5 o'clock in the morning to take an early train to New York. Long before 5 o'clock I was at the hotel door waiting to catch a glimpse of him as he came out, still undetermined whether I should speak to him. But when he appeared I could not resist the impulse to step up to him and give him my hand. He received me in his usual quiet way, expressing pleasure at the accidental meeting, and complimenting me upon my habit of early rising, he entered the carriage and was driven off.

More than a year after I got that undeserved compliment from Mr. Pardee about my early rising, I met him in a railroad car. He courteously invited me to take a seat with him, and immediately asked me how his "investment at the College was paying." I assured him that, while it was paying him no cash dividends, it was bringing a most happy return in the helpful aid it was to the College in its great and now growing work. But I told him that it would bring still larger returns if he would look after it himself by taking a seat in the Board of Trustees. At first, this suggestion seemed only to amuse him. "What do I know about the management of a college?" said he. But we discussed the subject pretty fully, and what his decision was may be seen in the College catalogue of the next year, where in the list of Trustees appears the name, ARIO PARDEE, Esq., HAZLETON, PENNSYLVANIA.

To the duties of his new office Mr. Pardee bestowed the same thoughtful attention which he gave to everything he undertook. It was soon evident to all his colleagues in the Board that he did know a great deal about "the management of a college." He made himself thoroughly acquainted with the minutest details, and was soon convinced that at Lafayette College as well as in many business operations in which he had invested, "an additional assessment upon the capital stock already paid in" was rendered very desirable, if not absolutely necessary, by the enlargement of the business! What this conviction prompted him to do, and how quickly it was done, is best told in the "Announcement of the College Course of Studies" in the same catalogue which first contained his name as a Trustee. After the usual announcement of the old course

of liberal studies in the College and the pledge of the Trustees to endeavor to give it "greater efficiency year by year," it is added:

It is evident, however, that the number of students in our country is great, and constantly increasing, who wish to study the Natural Sciences, Mathematics, Modern Languages and Literature, History, Rhetoric, Logic, and Mental and Moral Philosophy, as thoroughly as they are studied in our best colleges, and who would be glad to enjoy the culture and learned habits and associations of college life, but who will not study Greek and Latin. To secure these advantages for such as prefer to pursue their studies at Lafayette College, A. Pardee, Esq., of Hazleton, Pennsylvania, has placed in the hands of the Trustees the sum of \$100,000. The Trustees have accordingly established such a course under the name of the Pardee Scientific Course in Lafayette College.

The further statement in the catalogue that the "Pardee Scientific Course" was to be a "part of our present collegiate system, which has grown up under the fostering care of the Church," and that as far as possible "the old approved methods of College education would be retained as a thoroughly tried means of securing the culture and of imparting the learning becoming a Christian scholar" was received by educators with some surprise. They were familiar with business or commercial colleges, in which students were especially prepared for a business life. They also knew what the distinctly Technical schools meant, such as the Rensselaer at Troy or the schools for Technical instruction which were co-ordinated with some of our older colleges, such as the School of Mines at Columbia or the Sheffield Scientific School at Yale. But many persons gravely pondered over this "new departure" at Lafayette, where all the students-Classical, Scientific and Technicalfrom their Matriculation day to their Graduation, made one college family and were taught and governed by one Faculty. It was long before it came to be understood that the College roll showed no other division than the long established one of four classes—Seniors. Juniors, Sophomores and Freshmen. More than once I was asked, "Do the students in the Pardee Scientific School really attend chapel prayers?" But I must not enlarge upon this. As I have already said. I am here this morning to talk to you about Mr. Pardee, not to discuss even those educational questions involved in the Course of Scientific and Technical studies which he added to the curriculum of the College.

But I must say one thing in this connection. Mr. Pardee fully shared in the conviction of the members of the Board and of the Faculty, that the new Course should have the same Christian character which had been impressed upon all the studies of the College ever since its foundations were laid in prayer and faith by Dr.

Junkin a generation before.* Mr. Pardee was in complete accord with the view, not only that all the departments of instruction at Lafayette "should be in the hands of Christian scholars," but that in the new Scientific Department no less than in the old College Course there should be "a systematic and thorough study of the Word of God." He was himself a reverent and diligent student of the Bible. His pastor, Rev. J. G. Williamson, in a sermon preached on the Sabbath after the death of Mr. Pardee, referred to his "custom each morning to go into his library and spend a portion of an hour in reading the Scriptures," and he added: "The Bible used by him at such times is all thumbed and marked." And Mr. Pardee always spoke with the highest approval of the announcement of the ,' Course of Biblical Instruction," made in the College catalogue the year before his becoming a Trustee; of which the concluding paragraph is this:

The truths taught in the Bible in relation to the character, powers and duties of man are inculcated as fundamental in Mental and Moral Philosophy, and the philosophy of history is identified with the history of redemption. It is designed to make the Bible the central object of study in the whole College Course.

With these great additions to the Funds of the College and to its Courses of Study, the Annual Commencement of the College in 1866, as may readily be imagined, was a time not only of great interest but of great rejoicing. Never in all its history had there been so large or so enthusiastic a gathering of its Alumni and friends. Dr. Junkin and Mr. Pardee were both present; the observed of all observers, as they will always be the central figures of interest when the subject of Lafayette College is uppermost in the thoughts of men.

And now, with five distinct Courses of Study fully organized, with a large and able Faculty and a scientific equipment creditable for those days, the College went on with its work—no one watching its progress more closely or with a more absorbing interest than Mr. Pardee. But he soon became convinced that a still larger addition was needed to its funds for the more efficient prosecution of its work, and in a letter to me, July, 1868, he offered to add eighty thousand dollars to the sum (\$120,000) already contributed by him, provided other friends of the College would add a like sum of \$200,000. "The donations for this purpose," says the College catalogue of the next year, "completing nearly half a million dol-

⁶ Dr. Junkin's name appears in the list of the Faculty printed in the same catalogue which announces Mr. Pardee's accession to the Board of Trustees. He had resigned the Presidency of Washington College, Va., and now, as Emeritus Professor of Metaphysics and Lecturer on Political Philosophy, was again connected with the Lafayette of his early love and of his self-denying and devoted labors.

lars lately added to the College funds, were made before January 1st, 1869," and then Mr. Pardee promptly drew his check for the amount of his new subscription.*

With the greatly enlarged number of professors and students, the need of enlarged accommodations and of a better equipment in the way of apparatus and scientific collections was seriously felt. This was the subject of frequent discussion between Mr. Pardee and myself, and I knew very well just what would be the outcome. At a meeting of the Synod of Philadelphia, held in Scranton in October 1870, I discussed fully the great work now done at the College in its various departments of study and the need of further endowments for the support of the professors, as well as the need of new buildings, additional dormitories and professors' houses, a chapel, a gymnasium, a library building, etc. I emphasized also the need of a building specially adapted for the studies in the new Pardee Scientific Department, but I added:

Although it is the most expensive of all our much needed improvements it is among the least of my anxieties. There will be no appeal to the public for this. Only let it be seen that the general College departments are provided for by the Presbyterian community, upon which, in all directions, are radiating from this centre of high education such manifold blessings, and we shall soon see rising upon College Hill a building that shall combine the best features of the most celebrated Technological institutions of this country and of Europe, fitted up with all the appliances of modern scientific culture and every way worthy of the enlarged and comprehensive views of the munificent founder of the department.

Of course, I did not speak these words unadvisedly. In fact, I had read them to Mr. Pardee from the manuscript of my address before I delivered it. He simply said: "All right"—for he was a man of few words, though they were always to the point. In the following Summer Mr. Pardee, seated in the study at my house, asked me for a sheet of paper and rapidly wrote these two pages which I shall read to you from his manuscript—you will see that what he here says is also to the point:

EASTON, PA., July 24, 1871.

Dr. W. C. CATTELL.

My Dear Sir:—We have had many conversations as to the proposed building for the Scientific school, but so far have arrived at no definite conclusion, except that a building is absolutely necessary and must be built at no distant

When the history of the College in those days is written, there will be grateful mention of what was done by others whose gifts for the enlargement of Lafayette were added to those of Mr. Pardee. By far the larger part of all the donations to Lafayette College during my administration was made by the Trustees who, like Mr. Pardee, gave also in its service so much time and labor out of their busy lives. I can here write only the honored names of those generous members of the Board who have passed away:—William Adamson and Morris Patterson, of Philadelphia; Thomas Beaver, of Danville, Pa.; B. G. Clarke, of New York City; Joseph H. Scranton and Thomas Dickson, of Scranton, Pa., and G. Dawson Coleman, of Lebanon, Pa.

period of time. The growing wants of the College from the present and large prospective increase in the number of students surely indicate that that time is now. Will you therefore submit the plan of the interiors prepared by the Faculty last Winter, or such amended plan as on further consideration is deemed preferable to competent architects for a plan of the exterior, with estimates of its cost? The material to be stone. The style plain and substantial, yet such as may not look out of place in the beautiful natural scenery with which it will be surrounded. The cost not to exceed Two Hundred Thousand Dollars. If the plans can be prepared in time, it would be my wish to put in the foundations this Fall, that they may have the benefit of the Winter settling. While I do not, as in my former gifts to the College endowments, make my contribution of the cost of this building conditioned on an equal sum being raised by other friends of the Institution, yet I shall be much disappointed if in the cost of other needed buildings and contributions to the Endowment Fund they do not place themselves on more than an equality with me.

Respectfully yours,

A. PARDEE.

The construction of the building commenced in the early Spring of 1872, Mr. Pardee watching the progress of the work with intense interest. Fully occupied as he was in his varied and extended business operations, he found time to give it his personal attention. Nothing seemed to escape his notice. I recall his coming over to my house one day with his hands daubed with mortar. Noticing that I observed it as he went up to his room, he said "Yes, I have just come from the new Hall where I pulled down a portion of the walls; they were not put up right!"

The building was finished in the Fall of 1873, Mr. Pardee adding to his original donation of \$200,000, the entire cost of the furnishing and the Scientific equipment, making his gift for the Hall more than a quarter of a Million of Dollars.

Then came the great day, October 21 1873, observed as a general holiday in Easton and the neighboring towns and villages, when the magnificent building was dedicated. In the presence of a distinguished Assemblage that crowded every part of the Auditorium, R. W. Raymond, Ph. D., Lecturer upon Mining Engineering in the College and President of the American Institute of Mining Engineers, delivered an address full of noble thoughts. Himself eminent among the Scientists of our day he discussed with masterly ability the curriculum of the new Department, and showed the admirable adaptation of the Hall for Scientific and Technical studies. Mr. Pardee's munificent gifts had brought this scientific education within reach of the masses, and referring to this as an illustration of the beneficent use of wealth, Dr. Raymond said: "Such wealth ought never to rouse the faintest sigh of envy. Every poor

man in Pennsylvania has reason to be glad and give thanks to-day that Ario Pardee is rich." And the great Auditorium rang with applauding cheers. In the afternoon there was an imposing procession of the authorities of the Borough and of the adjoining towns, together with various civic and military organizations of the Valley, the schools and many citizens, which, after parading the streets of Easton, visited the College grounds. In the presence of this vast throng of many thousands gathered in front of the Hall, Mr. Pardee, holding the keys in his hand, addressed me in these few but well-chosen words:

The completion of this building makes it a very pleasant duty, on behalf of the Building Committee, and myself as the donor, to formally present it to you as the representative of the Trustees and Faculty of Lafayette. The building itself speaks of the skill and taste of the architect, the faithfulness of the builder, and the care with which it has been supervised during its erection. Our responsibilities have not been small; but on you, Sir, and on the students who shall go out year by year from these halls, rests a far larger responsibility—the reputation of the Institution. But, looking to the future by the light of the past, we rest the responsibility on you with no misgiving. I have the honor, Sir, of now presenting you with the Keys of the Hall.

Brief addresses then followed from high officials present—the Governor of Pennsylvania, the State Superintendent of Public Instruction, the President of the Easton School Board, the Chief Burgess of Easton, the President of the Borough Council and many others eminent in Church and State. In the evening there was an informal Reception at the building. The main Auditorium, the well-appointed Lecture rooms, the spacious halls for the Scientific collections and apparatus and the numerous corridors were all brilliantly lighted and thronged by an enthusiastic multitude.

This Reception recalls an incident which well illustrates Mr. Pardee's modesty. The Borough Council in accepting the invitation of the College authorities to attend the Dedication had, among other Resolutions, passed the following:—

Resolved, That a Committee be appointed in connection with a Committee of our citizens to confer with Mr. Pardee to ascertain whether it will be agreeable to him on the evening of October 21st, to receive the citizens of Easton who desire on that occasion to call upon him and testify their respect for him and their appreciation of the noble gifts made by him to the College.

To this Mr. Pardee made the following reply:

HAZLETON, October 13, 1873.

Messrs. Edward H. Green, John Stewart, McEvers Forman, and others, Committee,

Gentlemen.—I have the honor to acknowledge the receipt through Dr.

Cattell, of your kind invitation to meet in a public reception of such of the citizens

of Easton as should do me the honor of calling upon me on the evening of the 21st inst.

There will be on that evening a social gathering of the Trustees and Faculty with their families and the students of the College, in the new Hall, and there and with them I shall be happy to meet the citizens of Easton and other friends. While deeply sensible of the high honor conferred on me by your request, I would beg leave most respectfully to decline a more public and marked reception.

Very respectfully,

A. PARDEE.

This letter was sent to me with a brief personal note, so characteristic of Mr. Pardee's thoughtfulness and delicacy of feeling, that I must read it to you:

HAZLETON, Oct. 13, 1873.

Dear Sir.—I enclose my reply to the Committee of Citizens of Easton, which please hand them. I hope my conclusion will be agreeable to them, for I deeply feel their kindness and would do nothing that would seem to show a want of appreciation of it. But I could not bring myself to agree to a more demonstrative reception.

Yours,

A. PARDER.

This shrinking from any demonstration in his honor or, indeed, any public reference in his presence to the great work he had done for the College, was characteristic of Mr. Pardee. Of course, at Commencements and other public occasions such references could not be restrained, and they were always received by the assemblage with enthusiastic cheers. The older members of the Faculty will recall the ineffectual attempts at such times to get in response a speech from Mr. Pardee. Sometimes the prolonged cheers would get him upon his feet, but it was only to acknowledge the kindness of the company and to say he "never could make a speech." Once indeed, at the Commencement Dinner, Governor Pollock, who presided, did get a speech from Mr. Pardee, and it was a model of brevity, aptness and good sense, as well as modesty. Said he:

You give me too much credit and the Professors too little for the great work the College is doing. You should remember the answer the old painter gave when asked with what he mixed his paints to produce such wonderful effects. He said it was "with brains!" What would all the money given to Lafayette College have amounted to if the Professors had not mixed it with brains?

The Pardee Scientific Department was now fully equipped, and the number of students rapidly increased. The year following the dedication of Pardee Hall, the Freshman class numbered one hundred and fifteen, and the whole number upon the College roll was three hundred and nineteen. It can readily be imagined what labor and responsibility all this added for the Trustees &

the College, in which I can assure you Mr. Pardee took his full share. He "gave himself with his gift." Although so pressed was he by his numerous and varied and important business operations, that he never took "a day off" for a vacation, yet he took many days off from his own work, that he might by a careful study become thoroughly acquainted with the College management even in its minutest details. He never missed a meeting of the Board, and was always ready to serve on its committees, no matter how much time or labor the business in hand demanded.

And Mr. Pardee was so quiet in his manner and ordinarily so undemonstrative, that only those who knew him well could appreciate his force of character, and the promptness and vigor with which he discharged every duty. He never put off to-day's duty till to-morrow; and it seems the very "irony of fate," that when it was announced that he "left no will," the public journals referred to this as another illustration of the folly of men so immersed in business as to put off such an important duty from day to day until it is too late! Mr. Pardee never put off anything; and it is due to his memory that I should say here that his views as to this matter of a "will" were well known to his intimate friends. Everyone. he said, must decide this question for himself, but his own opinion was that the law provided a just and equitable division of a man's property among his family, and that any distribution other than to these he thought should be made by a man during his lifetime. Mr. Pardee was reticent as to what he himself would do in this as in most other matters, yet to those who knew what his few words meant upon any subject, the announcement that "Ario Pardee left no will," occasioned no surprise. It never occurred to them that it was through neglect; nor were they disappointed that he made no public bequests. He had given what he thought was right and proper during his life-time, when he might have employed all his money, as indeed so many do, in "making more," to be distributed by the "dead hand." The church edifice in which he worshipped at Hazleton was his gift, with the parsonage and the land on which they were built; and he gave to Lafayette College, in successive donations, as the occasion seemed to demand, half a million of dollars. What he gave more privately, here and there, can never be known. More than once was I made his almoner in the distribution of these private benefactions. When I happened to speak one day, (in his presence, but with no thought of appealing to him for aid.) of a clergyman, a friend of his and mine, who was painfully embarrassed for the need of a new overcoat, Mr. Pardee, as he left the room, slipped a fifty-dollar bank note into my hand, saying, "of course he need not know from whom this comes." What he gave in this quiet way is known only to the All-seeing One—but the aggregate must have been large.

To all of his colleagues in the Board he was uniformly courteous—often indeed hesitating to express his opinion upon questions of expenditure under discussion in the Board, lest he should seem to be "dictating" how his money should be spent! Naturally, with the President of the College he was brought into very close relations. Many and many conferences did I have with him, and upon matters of gravest importance. We met by appointment at his house and at mine, and on the cars, and at hotels in New York or Philadelphia, and discussed important principles in College administration and minute executive details. Not unfrequently there were conflicting opinions to be reconciled and opposite policies to be adjusted—enough, it would seem, to harass and irritate any man living; but he was always the same kind, patient, wise counsellor. Never, in all those twenty years, anywhere or at any time, did Mr. Pardee give me an impatient word. I cannot believe that any College President ever had, or ever could have, an associate in the Board of Management more considerately kind, more loyal, more helpful. To my honored successor in the Presidency Mr. Pardee was the same sympathetic and helpful friend and counsellor. Dr. Knox had taken his seat in the Board the same year with Mr. Pardee and, like him, had given his hand and his heart to the work. There were but few important Committees of the Board upon which both of these men were not placed; and Mr. Pardee soon learned to appreciate the high character, the learning and ability, the sound judgment and conscientious performance of duty which distinguished his colleague. When, therefore, in 1883, the Presidency became vacant, Mr. Pardee at once turned to Dr. Knox (as did the other members of the Board) and besought him to take the vacant Chair, and he was always to him the same steadfast, helpful counsellor that he was to me.

Had Mr. Pardee's life been spared he would have been the same to Dr. Warfield, and there are for me delightful memories which connect Mr. Pardee with your honored President. Serving with him upon the Executive Committee to which the Trustees referred the nomination of a successor to Dr. Knox, we were again brought together in many conferences as in former years, and I can testify to his joy when the good Providence of God brought Dr. Warfield within our view, and to his anxious solicitude lest by any delay we

should fail to secure him for the vacant chair. The very last lines I received from his pen had reference to this. Writing to me as Chairman of a sub-committee and in reply to a letter of mine giving reasons for immediate action he says:

I have yours this morning, and am decidedly in favor of making a square offer of the Presidency of Lafayette College to President Warfield, with the assurance on the part of the Executive Committee of the Board that he will be formally elected as soon as the Board can be convened. As far as I can do so, I would authorize you to make the offer either by letter, or by personal interview at once.

To us all it must ever be a cause for great rejoicing that Mr. Pardee was spared to witness the inauguration of your honored President at the last commencement, and on that happy occasion to place, as President of the Board of Trustees, the Keys of the College in his hands.

But now, returning to the earlier days, I must recall that night of horror—June 4, 1879—when we all stood helpless and agonized as we watched our beautiful Pardee Hall burn to the ground. But upon that scene I dare not dwell. I never can recall it without a shudder.

Let me hasten to say that in less than eighteen months a new Pardee Hall arose, constructed upon the same general plan externally as the first, but much improved in the interior arrangements, as suggested by the eight years' experience of the first building. And then came another Dedication Day-November 30, 1880more glorious even than the first. The Rev. Dr. Paxton, Moderator of the General Assembly of the Presbyterian Church, made the Dedication prayer, and our own honored and beloved Professor March delivered the address. The services of that ever memorable day are a matter of recent history, and you scarcely need to be reminded of the notable assemblage that graced the occasion. The Governor of Pennsylvania was in attendance with his Staff; the President of the United States came in a special car from Washington with a distinguished party, including two members of his Cabinet, and also the Assistant Postmaster-General, the United States Commissioner of Education, and the General of the Army; then there were high Dignitaries of the Church, distinguished Educators, Judges, Legislators and men eminent in all the learned professions and in business life; the borough authorities and other prominent citizens of Easton and of the Valley were present; from all parts of the country came congratulations by letter and telegraph; and the speeches on the College campus in the morning and those which

followed the Banquet given in the Hall were worthy of this most notable assemblage.

In his noble address to the great multitude gathered in front of the Hall the President of the United States emphasized the vital importance to a republic of popular education, and in conclusion said: (I quote from the New York *Tribune's* report)

Wealthy men understand that in no way can they do much good to those who come after them, in no way can they build to themselves such a monument that will preserve gratefully their memories in future generations, as by endowing a College, a University, a Scientific School. Therefore, my friends, we are here on this occasion, to do honor to the man who has set an example. And what an example it is! He does it while he is alive and can see that his wishes are properly carried out and the work well done. I am glad to be here, glad to join with you in saying God bless Mr. Pardee!

The mention of Mr. Pardee's name led to loud and long-continued cheers and repeated calls for him to make a speech. With some difficulty I persuaded him to come out from the rear of the Presidential party to the front, in full view of the multitude, and when silence was restored, he simply expressed his delight that the building was "completely restored and even improved for its work," but modestly disclaimed all credit for this. "It is," said he, "through the wise forethought of the Trustees in keeping up an ample insurance that we have to-day the Hall restored to the College." Notwithstanding this modest disclaimer, the afternoon addresses in the crowded Auditorium had frequent references to his munificent gift, and every mention of his name was received with prolonged cheers. Said the Secretary of War, Ex-Governor Ramsey, of Minnesota, an Alumnus of Lafayette: "But we are here to-day to inaugurate this grand Hall, one which every man in the country, and especially Pennsylvanians, will be proud of, the munificent gift of one great public benefactor. The world everywhere may be proud of such a man;" and General Sherman said: "He has received to-day stronger thanks than words, for he can see in every face how much his act is honored and appreciated. His name will be honored for all time."

But I cannot linger upon the memories of that happy day; I must come now to the severance of the intimate official relations between Mr. Pardee and myself upon my retirement from the Presidency of the College; and although these last words I fear must be even more personal to myself than what has preceded, I must, if for no other reason than to illustrate Mr. Pardee's kindly sympathy, refer to what was to me so great a trial.

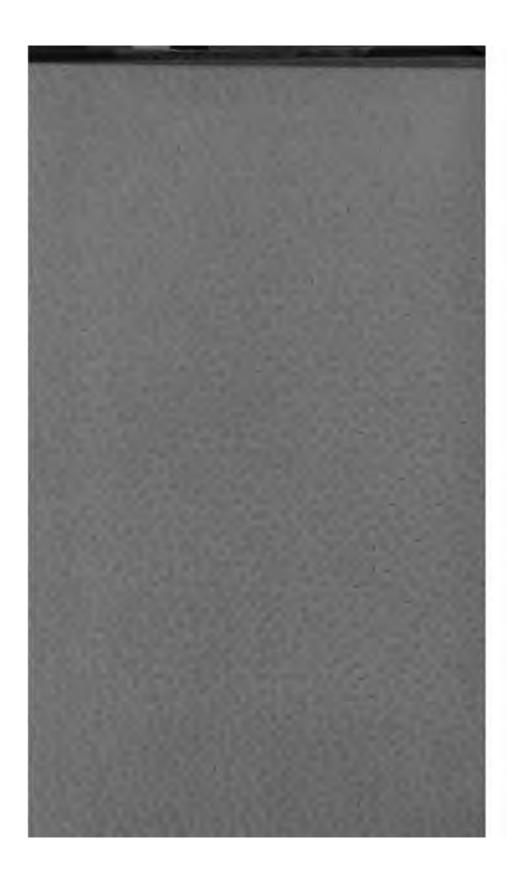
The President's report to the Trustees of the College at the close of the fiscal year 1882, is printed in full in the *Lafayette Iournal* of January 1883. After a somewhat extended review of the year, "the most delightful to me since my connection with the College," it closes with these words:

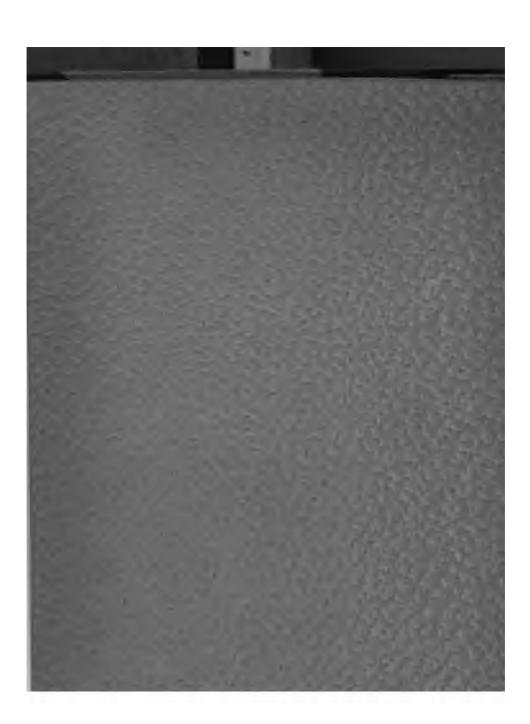
With such pleasant recollections of the year just closed, and with such a brightening outlook I enter upon my twentieth year of the Presidency with only one misgiving; and that is whether, in the present state of my health, I have the strength fully to discharge the arduous and responsible duties which are inseparable from my position. I am deeply grateful for the generous and unfailing support of my colleagues in the Board and the Faculty and of the Alumni, but even with this help the continuous anxiety and strain of my ordinary work, and the necessity at times of severe and prolonged exertion, seem to me to demand more than my present strength. But I am firmly persuaded that the great work here will continue with increasing power and usefulness, whoever may be the mea honored of God to carry it on.

What was foreshadowed here became definite as the year went on. My health was utterly broken by the long and exhausting strain of twenty years and, assured by my physicians that only a prolonged rest, perhaps for years, from work and from all responsibility, could restore it, I laid before the Board at its next meeting in June my resignation of the Presidency. Of course I had not taken this step without full conference with Mr. Pardee, and it is with the deepest emotion I recall his tender and thoughtful sympathy during all these trying hours. He was at my house more frequently than ever, and his letters showed a kindly consideration that if possible endeared him to me more than ever. "I shall very much regret," he wrote, "if your conclusion as to resigning is final," but fully recognizing the condition of my health he adds that however painful the separation may be, "your own judgment and that of Mrs. Cattell as to what is best for you should and must govern." Though he was willing to serve, and did serve, on the Committee appointed by the Board to request me to withdraw my resignation and to arrange, if possible, some plan by which I could secure the needed rest and still remain at the head of the College, he saw in this last conference with me on the subject that it could not be done—and the intimate official relations between my honored friend and myself, which had existed for so many years came to an end. The last official act I performed as President of Lafayette College was in this hall, which bears his honored name. On Founder's Day, October 21, 1883—just twenty years, to a day, after my election to the Presidency-I presided over the exercises in this Auditorium, and when I left PARDEE HALL that day, I was no longer President of Lafayette.

I must add one thing more—a reference to the last sad rites that were paid to his memory in Hazleton. Mr. Pardee had lived in the town for more than fifty years—always a kind and thoughtful friend, a helpful neighbor, a just and upright citizen; and his home life was one of typical beauty. He was a man so pure in his heart, so stainless in his life—in every way so upright—that those among whom he had lived so long and who knew him so well, could set his character before their sons as the model upon which their own might well be formed. Prospered in his business he had become a millionaire, but he lived among his neighbors and friends always the same simple, unostentatious, kindly life; and on the day when he was borne to his grave the very streets of Hazleton were crowded by them as they gathered to honor his memory. And men of high position came to Hazleton that day from other parts of the Valley and from distant cities and towns-men who had been long associated with Mr. Pardee in his many and varied business enterprises: the College too was represented—its honored President was there and members of the Board of Trustees and of the Faculty and many Alumni. Never had Hazleton witnessed such a great and notable throng of men as were on that day gathered to show their profound respect for the memory of Ario Pardee.

Although I could not, for one moment, hesitate to accede to the request of the family that I should make the address, yet I said then, as I say now to you as my closing words, Mr. Pardee was so dear to my heart that my place on the day of his funeral should have been, not in the pulpit but in those seats where, around his lifeless body, the stricken members of his household during this service sat in their silent and sacred sorrow.





Lafayette College

Commencement Addresses

1803



Key John R. Davies, D. D. Peci, W. W. Keen, M. D. LL D.



LAFAYETTE COLLEGE COMMENCEMENT ADDRESSES

1893



"What Shall I Do With Jesus?"

BACCALAUREATE SERMON

BY REV. JOHN R. DAVIES, D.D., CLASS OF 1881, PASTOR OF THE FOURTH PRESBYTERIAN CHURCH, NEW YORK CITY

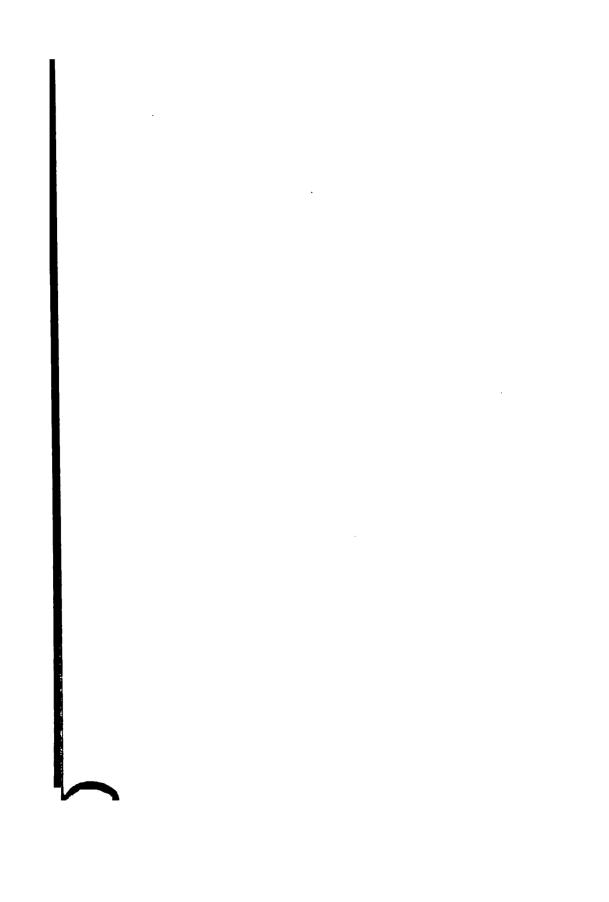
"Medicine as a Career for Educated Men"

ALUMNI ADDRESS

BY WILLIAM W. KEEN, M.D., LL.D., PROFESSOR OF THE PRINCIPLES OF SURGERY AND OF CLINICAL SURGERY, JEFFERSON MEDI-CAL COLLEGE, PHILADELPHIA, PA.



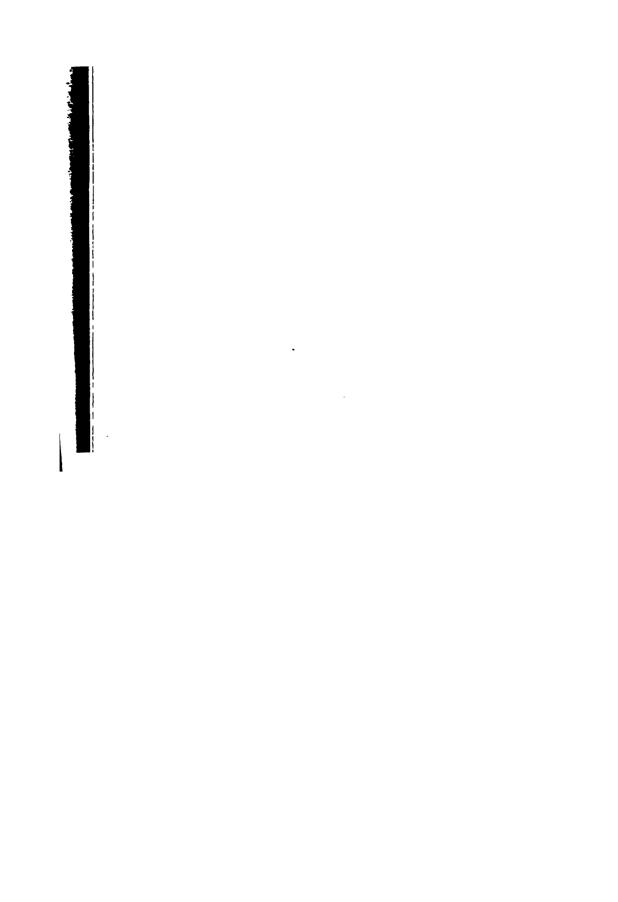
LAFAYETTE PRESS



PREFATORY NOTE.

THE addresses printed herein were received with so much favor by those who heard them that the trustees directed that copies should be asked for publication. Dr. Davies and Professor Keen having kindly consented to do so, they are now printed for distribution among the alumni and friends of Lafayette College.

MIDSUMMER, 1893.



WHAT SHALL I DO WITH JESUS?

BY REV. JOHN R. DAVIES, D. D., CLASS OF 1881.

PASTOR OF THE FOURTH PRESEYTERIAN CHURCH, NEW YORK CITY.

Matthew xxvii, 22.—"Pilate saith unto them, what shall I do, then, with Jesus who is called Christ?"

HERE are three cities which were very prominent in the ancient world, and which, though in a sense dead, are still coloring the life of to-day. I refer to Rome, Athens, and Ierusalem. To the last of these we are now invited by our As we approach its gates, we are surrounded by the opulent beauty of an oriental spring. As we move along its streets we find that it is the Passover week: and what at this moment is the most impressive sight in this ancient city? Is it these altars smoking with the morning sacrifice? Is it these temple pinnacles radiant with this Pascal sunshine? Is it these thronging thousands who have come from all parts of the world to spend this sacred week in this holy place? No! The most impressive sight in Jerusalem-yes, in all the universe-is yonder lone prisoner at Pilate's bar. • Repeatedly has the Roman governor attempted to release him, but repeatedly has he been frustrated, upon the one side by his own cowardice, and upon the other by the unrelenting bitterness of the Jewish At last, as though to shirk the responsibility of a crime that he could easily prevent, he asks the question: "Whom shall I release unto you?" And immediately comes the unanimous answer: "Barabbas." But why is Pilate so much concerned about this obscure, despised, and friendless prisoner? Surely in an age when life was so little regarded he might have slaughtered a score without any one calling him seriously to account. But, though obscure, despised, and friendless, Jesus of Nazareth is no ordinary prisoner. Pilate realizes, and has a deep conviction that these mysterious

claims to be the Christ, the King of the Jews, have a far more substantial foundation than the baseless assertion of empty words. And here lies the power of my text in relation to the life of to-day, not in the fact that it was first spoken by a Roman governor, not in the fact that it was first addressed to God's chosen people, not even in the fact that it is found upon the pages of the gospel, but because this question concerns the divinely appointed, the eternally ordained Redeemer of men, and therefore, with the best of reasons can we say to a modern audience, what then, are you going to do with Jesus who is called Christ?

Before proceeding further, let us look briefly at some of the claims of Christ. Standing upon the Mount of Olives, He said: "I am the light of the world: he that followeth me shall not walk in darkness, but shall have the light of life." In the fourteenth chapter of John, He said: "I am the way, the truth, and the life: no man cometh unto the Father, but by me." After the multitude had been fed with the loaves and fishes. He said: "I am the bread of life: he that cometh to me shall never hunger; and he that believeth on me shall never thirst." When certain Greeks desired an audience, He said: "And I, if I be lifted up from the earth, will draw all men unto me." As a parting message to His disciples He said: "All power is given unto Me in heaven and in earth. Go ye therefore, and disciple all nations, teaching them whatsoever I have commanded you." And one of the most solemn of the parables which close the Master's ministry, represents Him as coming at the end of all things, surrounded by the pomp and splendor of the skies, to separate the sheep from the goats, and to sit in final judgment upon an assembled universe. Such are a few of the many claims of Christ to be met with in the gospels. You can not find their equal among the utterances of the world's great leaders. No scholar, no matter how great his learning; no conqueror, no matter how numerous his conquests; no monarch, no matter how world-wide his dominions, would have

dared for one moment to have given utterance to such claims; and when we look at them through the light of the evidences whereby upon every side they are surrounded, we do not wonder at the testimony of Peter, endorsed by the great and good of every succeeding century, "Thou art the Christ, the Son of the living God."

I.—In looking at the foundations upon which these claims rest, we will call your attention first to the teaching of Christ.

You will recall the words of Nicodemus, "Rabbi, we know that thou art a teacher come from God: because no one can do these miracles that thou doest, except God be with him." This significant statement has been confirmed by Jew and Gentile, by all branches of the Church Catholic, by every one who has sincerely and candidly studied the words of Christ. There is about them a peculiar tone of authority. While the Master referred to the Jewish Sanhedrim, and while He quoted from Old Testament writers, yet far above the law of Moses, the psalms of David, the prophecies of Isaiah, He placed His own words and work. Thus we are told that He spake with authority and not as the scribes, and when at last He would send forth His disciples, He bade them teach whatsoever He had commanded them, and in the case of each believer that teaching was to be sealed with a baptism, not only in the name of God the Father, not only in the name of God the Spirit, but also in the name of God the Son, as being upon an equal plane of power and glory with the other persons of the Trinity.

There is also about His teaching a mingled sublimity and simplicity. God and Man, Sin and Redemption, Life and Death, Time and Eternity, Probation and Judgment—these were a few of the majestic themes that presented themselves to the Master's attention, and were so discussed that His hearers were lifted to transfiguration mounts, to celestial spheres, and for a time, all too brief, conversed with the Divine and the Eternal. And yet, marvelous to tell, instead of confusing His listeners with scholastic subtleties, instead of concealing truth

in verbal fogs, instead of strewing the pathways of knowledge with perplexing enigmas, the grandest revelations that Christ ever made were communicated in the first instance to the humblest of mortals, in the simplest of speech, so that the commonest of the people heard Him gladly. And there is, furthermore, about Christ's teaching a wondrous power which not only penetrates the secret recesses of the soul and brings to the lip the confession of guilt, but also quickens the intellectual and spiritual faculties, so that men in every walk of life coming under the influence of such a teacher have been filled with newer, with diviner inspirations, and from this source modern civilization has received some of its grandest benefactions. There is also about this teaching the power of continuance. Call the roll of the ponderous volumes, the schools of thought, the numerous teachers, which for a moment have shone in the intellectual skies and then have disappeared in the darkness; while of Christ as a teacher it can well be said that His kingdom is everlasting, and in spite of English Deists, French Encyclopædists, and modern Agnostics. His influence, like the incoming tide, is cumulative, is ever-rising, and upon its celestial crest is ever lifting the minds and hearts of men more and more into loving fellowship with the mind and heart of Almighty God.

II.—In the next place we will call your attention to Christ's character.

Sin is one of the great factors of the world's history. It has blackened every page, distorted every sentence, accented every word, and defiled every character, no matter how high the position he may have occupied, or how low he may have grovelled in the dirt to eke out a miserable existence. Sin is also one of the great factors of the present. It surrounds you on the street; it beleaguers you in your business; it confronts you in the members of your body and in the faculties of your own soul. Upon every side arise a thousand witnesses to prove the truth of sacred Scripture that all have sinned and come short of the glory of God. But amid this dark and loathsome flood of sin

there rises one pre-eminent exception, Jesus of Nazareth, who alone is holy, undefiled, and by impassable gulfs separated from the least appearance of evil. And this purity of soul was maintained, not like that attempted by St. Anthony and his followers amid the solitude of the desert, amid the lonely retirement of some mountain fastness. No: Jesus of Nazareth lived and moved amid the heaviest burdens, the greatest perplexities, the subtlest temptations, and though He was the continued object of the bitterest malice, yet none of His enemies were able to convict Him of the slightest sin. In further confirmation of His spotless purity is the fact that while He spake most emphatically concerning the wages of sin, while with an earnestness all divine He called others to repentance, and while upon the cross He freely gave His own life as a sacrifice for human guilt, yet never by word or look did He at any time intimate that He needed such warnings or feared such punishments, or required such a redemption.

You speak of Pontius Pilate and you see a Roman; of Judas Iscariot and you see a Jew; of Saul of Tarsus and you see the Greek influences of his birth and education. But where will you place Jesus of Nazareth? Though born in a Jewish town and of the purest Jewish blood, He is a member of no race, a subject of no kingdom, a citizen of no republic, the exclusive property of no clime nor country. Like the sun, which, ignoring geographical boundaries and race distinctions, comes with a necessary blessing for all, so Christ, the Eternal Son of Righteousness, ignoring all these limitations, brings to every soul the Way, the Truth, and the Life, so that your cultured Caucasian and degraded Hottentot can find in Christ the very redemption for which their souls have yearned, and in this fact you may see something of the cosmopolitan, the universal character of Christ, the world's redeemer.

Then there is something so ofiginal about this man, Christ Jesus. You have two natures, the human and the divine, without mixture or confusion, uniting in the personality of the Christ. Then look at some of the more prominent features of His ministry—the temptation in the wilderness, the rejection by those He came to save, the mystery of Gethsemane, the brutality of the trial, the mingled shame and agony of the cross. Tell me, what writer born of woman would have marked out for the world's Redeemer such a mystic personality and such a unique career? And in connection with this, consider the moral grandeur, the complete consecration, the utter unselfishness of soul, displayed by Jesus of Nazareth as he stands amid the unbridled cruelty, the unlimited selfishness, the unfathomed lust of that period, like some lone star amid the darkness of earth's blackest night. Pointing to the gracious beauty, the delicate fragrance of the lily, I ask who fashioned this flower with such loveliness, such purity, amid the unclean waters and the filth of the lake bottom, and at once you reply, the finger of God. So when you come to candidly study the beginnings of the Christian era, so shorn of noble endeavor, so stripped of great men, so thoroughly a stranger to lofty inspirations, so utterly absorbed in the worship of the sensual and the skeptical, I am sure you will join with me in saving the appearance amid such surroundings of Christ, the Lily of the Valley, the Rose of Sharon, is the greatest moral miracle of the ages, and can be attributed to none but God Himself.

III.—In the next place, consider the influence of Christ.

In the city of Paris there sits an Arbitration Court to settle a question which in other days would have been deemed quite sufficient to have plunged nations into war, to sacrifice thousands of lives and to squander millions of money. And this Arbitration Court, which is neither the first nor the last, is an indication of the widening, the deepening sense of the brother-hood of man, which sooner or later must make our armies and navies more needed for show than for service. Few names stand higher in Roman history than those of Cicero and Seneca; few men have had more influence over the world's thought than Plato and Aristotle, and yet, these men approved of that fiendish

custom which thrust the babe out of the home where it was born, and from the breast where it had a God-given right to be nurtured, to die of exposure upon the street, or to be torn in pieces upon the desert by wild beasts a thousandfold more humane than man. To-day, for the friendless foundling we build magnificent homes, which lack nothing except that priceless gem, a mother's love; while in our families we crown childhood with garlands of the tenderest affection, and are willing to suffer any self-denial in order that they may have everything necessary for their welfare and comfort. We rejoice in the civil liberty which enables each citizen to exercise a direct influence in the settlement of every question affecting the public weal; and we appreciate still more the religious freedom which enables us to worship God according to conscientious conviction, which no man dare condition or fetter. But we have not always enjoyed these privileges. Look backward along the past, and you will easily find the grossest tyranny upon the throne, and in the church a despotism that will stoop to any cruelty in order to accomplish its hell-born purposes. You remember the sanctity which used to attach itself to the personality of the clerk with the merest smattering of learning; you remember the imperfect structures in which Baeda, Alcuin, and even Abelard gathered their pupils and you will remember that during the thirteenth century the greatest library in Europe was that of Glastonbury Abbey, consisting of about four hundred volumes. Now, one of the significant features of these modern times is the fact that none who have grit and brains need enter life without a liberal education, because we are surrounded in town and city by extensive libraries, by superb foundations of learning, that are saying to every young person without a chance: Prove yourself to be worthy of help and that help we will furnish. In early summer, when the last traces of winter's frosts and snows are departing, you say there is some subtle force responsible for this revolution which causes the meadows to robe themselves in green, the forests to unfurl their banners of foliage, and the

flowers to swing their fragrant censors along the pathways of men. So, when we look over the history of nearly nineteen Christian centuries, and mark the vast changes represented by far-reaching movements; when we come in contact with an order of things ever working in the direction of righteousness; when we see Sauls of Tarsus becoming apostles to the Gentiles, Magdalens restored to purity, prodigals redeemed from the foolishness and filth of the far country and made to be useful and honored members of society; when we watch, in spite of all downward tendencies, the human spirit rising in everything that constitutes the truest, the holiest manhood, we are profoundly convinced that for such a radical transformation there must be a sufficient cause; and in search of this cause we turn to Rome with her empire, to Greece with her scholarship, to Tyre with her commerce, to Babylon with her glory, to the farthest Orient whence have come so many mysterious messengers; but no satisfaction do we find until we stand amid the gathering darkness, looking upon the pallid features of the crucified Christ. Yes, strange as it may seem, in this stumbling block to the Jew, in this foolishness to the Greek, in this despised, obscure peasant, you have the secret of the progress which has changed the face of the ages, rewritten human history, and is destined to sweep on in larger volume, in deeper current, until the kingdoms of this world shall have become the kingdoms of our Lord and His Christ.

IV.—In the last place, consider the testimony of the scriptures. When Christ said "Search the scriptures for they are they which testify of me," He never gave a more important command or spake a truer word. And if we had time this morning to fully and carefully examine the sacred volume, we would find its every book bearing an eloquent, peculiar and powerful testimony to Him who is the Prophet, Priest and King of men. But we have opportunity to consider only and briefly the New Testament, and in so doing we find that it ascribes to Christ Divine titles. Turning to John i, I, we read: "In the

beginning was the Word, and the Word was with God, and the Word was God." In Romans ix, 5, we read: "Whose are the Father's, and of whom as concerning the flesh Christ came, who is over all, God blessed forever." The New Testament also ascribes Divine attributes to Christ. He is immutable—the same yesterday, to-day, and forevermore. He is omnipotent all power in heaven and earth is placed at His disposal. He is eternal-to His enemies He said, "before Abraham was I am;" and in the upper room He prayed, "and now, O Father, glorify thou me with thine own self, with the glory which I had with thee before the world was." He is omnipresent—to His disciples He gave the promise, "where two or three are gathered together in my name, there am I in the midst, and lo, I am. with you always, even unto the end of the world." He is omniscient—He knew Nathaniel while he was yet under the fig tree. He read the secret purposes of Judas before the betrayal; and the truth upon this important point is well summed up in the impassioned words of Peter, "Lord, thou knowest all things; thou knowest that I love thee." The New Testament. furthermore, bids us render Divine honors to Christ. In John v. 23, we read: "That all men should honor the Son, even as they honor the Father: He that honoreth not the Son honoreth not the Father that sent him." In Philippians ii, 9, 10, 11, we learn that, "God hath highly exalted Christ and given him a name which is above every name; that at the name of Jesus every knee should bow and every tongue should confess that Jesus Christ is Lord, to the glory of God the Father." And in the closing verses of the fifth chapter of Revelation, we see that multitude which no man can number ascribing blessing and honor unto Him that sitteth upon the Throne and unto the Lamb forever. Now this divine exaltation which the New Testament gives to Christ is the very position that we would naturally give to Him who has exercised such a vast influence over the ages; while, upon the other hand, such a vast influence we have a right to expect from One who sits upon the Throne

of the Universe, and Christ's right to such a regal station is strengthened by every argument that can be used for the inspiration of the scriptures, and by the fact that with a Divine Christ, possessed of Divine attributes, the author of Divine works in the sphere of nature and of grace, you can explain the upward movement in human history; you can vindicate the character of God from every aspersion; you can answer the yearnings of every human soul, and you have a center around which the past, the present and the future may group themselves, and when you take this Christo-centric position underneath and amid the chaos and the confusion, the sin and the shame of to-day, you may see the glorious outlines of that City of God, which for centuries has been the inspiration of the Church Militant, and which will not need the ministry of sun, moon, nor star, because the Lamb Himself will be the light thereof.

I have given you the merest fragment of the grand argument for the Divinity of Christ; and yet I think that I have said sufficient to invest with a deep, a profound solemnity the question of my text, What shall I do, then, with Jesus, who is called Christ? This question, unlike many others that you meet, demands an answer. You may treat Him with undisguised hostility, and spend every resource at your command in attempting to soil the robe, tarnish the crown, break the scepter, undermine the throne of your best and truest King, but at last, like Saul of Tarsus, you will find it hard to kick against the pricks, and like many to-day you will realize that it is worse than madness to fight against God. You may treat Christ with indifference; you may become so identified with business, so absorbed in study, so attracted by the deceptive forms, the alluring colors in which the world presents itself upon every occasion that you will not care to consider the claims of Christ; but remember, such indifference is the malaria that will poison every fiber of your spiritual nature, and it is also the Niagara current, at first faint, but swifter and swifter it will flow, until at last you are dashed into the seething abyss, a ship-wrecked life, a ruined soul. But there is another attitude, and this is the one I beg you to assume. It is the one taken by Mary in the Resurrection Garden, when the glad cry of "Master!" came from her trembling lips. Simple trust, unfaltering obedience, supreme love, these are some of the elements which bound this woman to her Saviour; and now, as I part with you, never again to see some until we stand in eternity, I pray that God's Holy Spirit by these same golden chains of trust, obedience, and love will bind you to Christ, the Eternal Son of God, and then for you will be divinely answered the question of my text, What, then, shall I do with Jesus, who is called Christ?

MEDICINE AS A CAREER FOR EDUCATED MEN.

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EAUTIFUL for situation, the joy of the whole earth." was the description of ancient Jerusalem by its enthusiastic admirer. And surely any one looking on Pardee Hall would be justified in applying this encomium to Lafayette College. It is a genuine pleasure to me to join with you in your annual festival when your tribes come up to their intellectual Jerusalem, "singing their songs of degrees" as of old. And although the son of another academic mother, I rejoice with you in the prosperity and glories of your noble college. I see around me old men, graduates of the forties, with silvered heads, their paths in life chosen, their duties fulfilled, their lives culminating in honored, cultivated leisure and wide influence, whose achievements are recorded in the history of the world of art, science, literature, language, business and religion. I see again men in middle life, graduates of the sixties and seventies, alert for every opening for the best work in the world's great enterprises. They are in the fore-front of the fight against ignorance, vice, and irreligion.

But it is rather to the young men, and especially to you, gentlemen of the graduating class, who are now taking leave of these classic shades where you have spent the four most blissful and fruitful years of a man's life, to which he ever reverts as the halcyon days of youth—to you that I especially address myself. The joys, the trials, the studies, the achievements of your college life are now, or soon will be, over. The world stands open before you. "What shall I do?" is the question of questions to you. The decision of this question may make or mar you.

If you decide rightly you will achieve success, honor, happiness, and the final consolation of a life well and nobly spent. If wrongly, your decision may wreck, even hopelessly, a young life full of brilliant promise. You and your fellows in the many colleges of the land who will graduate in this leafy June have on your side youth with all its potencies. You have a just and laudable ambition. You are ready to work your finger nails off. You have trained intellects. You are members of the true aristocracy of learning, men of marshalled forces, the hope of the nation, the future natural leaders of thought in public and in private life. What shall you do? "Surely," says Carlyle in his Biography of John Stirling, "the young heroic soul entering on life so opulent, full of sunny hope, of noble valor, and divine intention, is tragical as well as beautiful to us."

It is of equal importance to the community as well as to you that you elect wisely what path you will follow in this busy world. Some of you will enter commercial life, lured possibly by hopes of material reward. Some may be devoted to art with its æsthetic enjoyments. Some will find in literature the contentment and fame that come to the successful author. Some will devote their lives to the highest human function and service to their fellow men, in winning them to Christ-like lives and heavenly aspirations. Some will seek the noble profession of the law and will become leaders of the bar and wear the ermine on the bench. Not a few, I hope, will devote yourselves to a scientific career with, it is true, its ceaseless toil, but also its fascinating investigations, its splendid discoveries, its beneficent inventions.

It is my desire to lay before you some of the rewards, the possibilities, the attractions of such a scientific life, and to win you to its pursuits, since it has attractions, wonderful attractions, from many sides and for every type of man, excepting always the lazy. I have selected as my topic, therefore, "Medicine as a Career for Educated Men."

I am met at the outset by the query, "Are there not already

too many doctors?" Yes; far too many poor doctors, but far too few good ones. Webster's oft-quoted remark that "there is plenty of room at the top" is as true of medicine as of any other profession. In any profession there is always a reserved seat in the front row for a March, a Faraday, a Schliemann, a John Hunter, a Lister, a Virchow, a Pasteur, a Gross. And although no one of you may become the peer of those I have named—and yet why should you not?—still there is always room right next to them for the trained intellects who will make their profession an integral part of their lives and devote themselves earnestly and truly to its pursuit. Never has there been such a demand in medicine for men of the highest type, the deepest insight, the profoundest spirit of investigation. Never have there been so many questions of grave import to the human race awaiting solution. The mighty problems of life and disease and death crowd upon us and await the touch of a master hand to make the obscure clear, to avert the dire results of accident, to stay the hand of the Angel of Death and say in dominant tones, "Thus far and no farther."

Medicine is looking to just such well-equipped, thoroughly trained men as you for its champions in this daily fight with death. And if you wish to rise above the dull level of mediocrity it will be to you college men that the renown which is the proper object of a laudable ambition will surely come. President Thwing in the June Forum states that Appleton's Encyclopedia of American Biography contains the names of 912 doctors of whom 473 were college-bred men. The Medical Record, commenting upon this fact, estimates that 300,000 men have started out in medicine in this country during the present century. If so, the chance of the ordinary doctor's becoming famous is about one in 300. But if he be a collegebred man it is about one in six. The profession, as I have said, is filled to repletion with poor men and untrained men. What we want is the men fresh from the laboratories of the best colleges, men whose minds are trained in logical methods, who

are versed in the "humanities," who possess refinement and culture, who, having eyes and ears, have learned to use them to the best advantage. In that delightful book, "The Gold-Headed Cane," Radcliffe—him of the library—visits Mead in his library and says: "As I have grown older, every year of my life has convinced me more and more of the value of the education of the scholar and the gentleman to the thoroughbred physician. Perhaps your friend there (pointing to a volume of Celsus) expresses my meaning better than I can myself when he says that this discipline of the mind, 'quamvis non faciat medicum, aptiorem tamen medicinæ reddit.'"

The signs of the times point to a closer affiliation of colleges and medical schools, which will be equally advantageous to both. Five years ago nearly all the medical schools in this country were two-year schools. Now nearly all have the threeyear courses and a few four, and the new Pennsylvania law requires four years of study, of which three shall be in a medical school. This movement in the direction of a more thorough education means that the medical schools desire to offer a curriculum worthy to attract the best educated men. Moreover, the medical schools are endeavoring to adjust their courses so that they will be the natural continuation of the college courses. Without sacrificing the symmetry and completeness of the college curriculum or abridging the studies for the medical degree, their aim is so to adjust the two that they shall be linked together as one complete whole. Thus many of the medical schools are considering what means can be adopted to draw into affiliation with them the colleges and college men in preference to others. The larger development of the Jefferson Medical College, of the medical departments of Harvard University, of the University of Michigan, of the University of Pennsylvania, and of Johns Hopkins, are evidences of the same wish to win the college men to a medical career. The union of the College of Physicians and Surgeons with Columbia College as its medical department, and the projected absorption of one or more of the Chicago medical schools into the University of Chicago show the same tendency. Moreover, the colleges are looking equally toward the medical schools, as I have pointed out, by the establishment of courses which will naturally lead up to medicine. In Brown University the same movement is actively taking shape through the Brown University Medical Association, and in several universities with medical departments similar steps have already been taken. It is a movement full of promise.

If any of you look forward to medicine as a career you should view it from three different standpoints. First on its economic side. This is a matter of no little importance, for every man in this world must earn his living and also naturally looks forward to the support, not only of himself, but of his wife and children in the future. No one should expect in medicine to make a fortune. A few doctors do so, but they are the exception. But every man who enters medicine, if he will be faithful and honest in his work, and a fortiori the more intellectual college man, can be sure of a competence, nay more, can be sure that he will enjoy not only the reasonable reward of toil, but be able to lay up sufficient for his own old age and for his family.

Secondly, a much more elevating and attractive side is the philanthropic or humanitarian. The medicine of the future will be chiefly in the direction of that most philanthropic object, the prevention rather than the cure of disease. Hygiene or Preventive Medicine has only arisen within the last forty years. It has already done much, but it promises far more. If it is necessary to show that the knowledge of hygiene is still limited, look at the recent reports on the sources of the water supply of New York. Nay, you need only go into the slums of your own city; or if you live in the more God-blessed country you may find a startling ignorance of the laws of health in almost every farm house. Nay more, you need only cross-question a half dozen of your intimate friends as to their modes of life to discover that the laws of hygiene are "more honored in the breach than the observance."

That there is ample room for missionary work in the matter of personal cleanliness alone will be evident from two recent incidents in my clinics at St. Agnes and the Orthopedic Hospitals. At the former, as I uncovered the feet of a woman to examine them in consequence of an accident. I was startled at their condition and asked her when she had had a bath. "And phwat's that?" was the innocent reply. At the latter, last winter, after examining the spine of a young lady of sixteen, the daughter of a respectable farmer, I said to the parents with a bluntness born of indignant surprise, "It must be a long time since your daughter has had a bath?" "Why yes," said her father, "I don't believe she has been in a tub in a year." To which his indignant wife replied, "Why of course she has, John. Don't you remember that bath she took last summer?" They probably agree with a witty medical friend who seriously avers that "everybody ought to take a bath once a year whether he needs it or not."

A recent census of a portion of the Chicago slum district also has disclosed the fact that in a population of 16,000 there were but *four bath tubs* and two of these were disconnected from the water supply! The entire community suffers from such indecency, uncleanness and necessary ill health of a part.

What a fruitful field there is in hygiene both for scientific and benevolent teaching as to plumbing, drainage, ventilation, clothing, food, drink, city architecture, city streets and sewage, city water supply and the eradication of all the evil influences which confront us, both in country, and especially in city life. Many diseases are now recognized as preventable, if the community were only alive to the necessity and the possibility of their prevention. "For every case of typhoid fever," it has been said "somebody ought to be hung"—a rough and epigrammatic way of stating what is undoubtedly true, that in a perfectly regulated community there would be no typhoid fever.

But besides such public benevolent service, there is a personal philanthropic side of medical life, to which I gladly advert. Picure to yourself the daily life of the doctor. It has undoubtedly its trials, many and great. The humdrum recital of ancient aches and pains sometimes becomes irksome by repetition. The doctor has patients upon whom he has bestowed unremitting care and his very best mental and physical powers, who have proved ungrateful and have even become his foes. He does an immense amount of unrequited service. His nights are disturbed, his days are not his own, of his family and friends he sees but little. But then, what calling does not have its trials? In what life is there not friction, which, as in mechanics, should be allowed for, and not permitted to become a source of irritation and annoyance? But in spite of all these trials, the doctor's life is so rich in its personal rewards, in its humane service, that it ought to be to him a daily joy.

There is to him a daily personal growth in knowledge. Every sickroom is a schoolroom, and every case a lesson, from which he comes a larger man. There is a daily personal growth in character, so that he should lie down each night a better man. There is a daily personal growth in his power to do good, which should be at once a reward of past work, and a stimulus to better. There is a daily personal growth in the friendships and esteems of life, which constitute one of the most delightful rewards of the doctor. What greater joy can there be in life than to go about among one's fellow men carrying with him, as the doctor does, an atmosphere of comfort, of hope, of courage, of health.

There come to him, constantly, cases in which disease challenges him to combat. It says to him, as it were, "Catch me if you can, in all my devious wanderings and unexpected disguises;" and there is a mental exhilaration in following every turn in the trail and running to earth the fleeing goblin, which is captivating to every inquiring mind.

Look for a moment at the methods of the careful, intelligent doctor, as he investigates such a case. First, he inquires with care into the family history for lurking influences of evil heredity. Next, into the personal history, not only the physical history of the patient from his birth, but the influences of his environment,

his habits, his hours of rest, his methods of labor, his physical and mental virtues and vices. Then follows the history of his present illness, including all his symptoms, the examination of his secretions and excretions, the shrewd judgment which eliminates the unessential and often the inaccurate or imaginative statements from those which are real and essential. Then too, he must not forget the influence of mental states; of worry, of family trouble, of personal trials. Next he passes to the physical examination of his patient, when his eye must be as keen as that of an eagle, his touch deft and delicate in estimating size, consistency, elasticity, and other physical conditions. He must then co-ordinate all the so far disjointed facts with a mental acumen and logical method which, at first laborious, becomes afterward comparatively easy if he has been faithful and thorough in his earlier investigations. By these means he reaches a diagnosis and settles definitely upon the medical or surgical treatment. Each case is then a study in physics, anatomy, physiology, pathology, psychology, chemistry, therapeutics. In the vast majority of cases he is rewarded by seeing returning health. Sir Spencer Wells as the net result of his first 1,000 ovariotomies added 20,000 years to human life, and so far has modern surgery surpassed this result that every thousand similar operations to-day add not less than 30,000 years to human life! Think what one of these lives means, as the pale cheek regains its color, the feeble pulse its force, strength succeeds weakness, each day records a gain, and finally health is re-established. The tender father returns to his usual pursuits; the adored mother once more becomes the center of loving care of her family; the beloved child is restored to the family circle with ruddy health, rescued from the valley of the shadow of death itself. The hushed voices, the soft tread of the sick room have given place to the laughter of health, the mists of sorrow are driven away, the anxious alarms of disease have vanished. What, think you, can equal the joy of the physician, as he views this happy transformation? Who is a dearer, more cherished, more welcome

friend than he? Who finds a warmer place by the fireside and in the very hearts of his patients? No one can adequately appreciate his profound joy, his daily delight, his deep gratitude to the "Giver of every good and perfect gift." Oh, my friends, it is a blessed profession, a divine calling, with a heavenly recompense on earth.

But sometimes death must come. Even here, however, the kind and sympathetic physician finds his place. Who can so tenderly guide the poor sufferer to his long rest, so gently assuage the pain of the dying? Who so endears himself to broken hearts in the hour of their bitter extremity as the strong yet tender Christian physician? Often, even death makes for us our dearest, most loving friends, who would pass through fire and water for us.

Even its dangers are an attraction akin to those which draw the hardy mountaineer toward the dizzy heights of the Matterhorn. And when to these dangers is added, in times of pestilence, the clarion call of duty to his fellow man, where has there been a recreant doctor? Point out the renegade if you can! The gallant Six Hundred who rode into the Valley of Death were no braver than the unsung heroes of Norfolk or of Hamburg. I glory in my profession that in such hours of peril it has known no cowards; the meanest soldier in its ranks has been a brave, unselfish, devoted hero, and oftentimes a faithful, gentle martyr dying at his post of duty.

But besides the economic and the philanthropic side, medicine has thirdly its splendid scientific aspect which fuses with both of the others, and yet may be regarded separately from them. Let me point out some of the best achievements and present problems of medicine. The present century has seen vast strides in every department of medicine. I will not weary you by mentioning the immense improvements made in many minor details which would be more suited to a technical audience, but it is proper that I should allude to three brilliant discoveries which stand out prominently as of the first magnitude.

First, the discovery of anesthetics. The beneficent results from this discovery are so well known that I need only call attention to them and also note in passing that the three principal anesthetics, ether, chloroform, and nitrous oxide, are American either by discovery, or by introduction into general use.

The second great achievement is the antiseptic method by one of our cousins across the sea, the justly immortal Sir Joseph Lister. While anesthetics have been an immense boon, especially in the domain of surgery, antiseptics have saved countless lives and untold suffering. The method is so recent that I have seen both its birth and its development. In our late war and for ten years after its close every wound and every operation was followed as a matter of course by fever and more or less suppuration, or the formation of "matter," which in a multitude of cases resulted in blood-poisoning, erysipelas, hospital gangrene, lock-jaw, and a hundred other kindred evils from this Pandora's box. Now, however, we are enabled to perform any one of the ordinary operations, such as amputations, ligations of the great blood-vessels, the extirpation of tumors and the like with almost absolute safety, and this surgical safety has emboldened us to perform many operations undreamed of even by an Astley Cooper, a Nélaton, or a Pancoast. The great cavities of the body, the head, the abdomen. the pelvis, and even the chest are invaded with a sense of security and an almost absolute certainty of recovery which would have astounded our fathers. Amputations which were formerly attended with a mortality of nearly fifty per cent, are now so free from danger that we always expect our patients to recover and are chagrined if they do not. Compound fractures, which twenty years ago often had a mortality of over sixty per cent., now scarcely occasion any anxiety, and ovariotomy, formerly a most dangerous operation, the rise of which I can well remember, has now a mortality of only ten, five, and even three per cent.

The third great discovery of the century is the new science of

Bacteriology, a child as yet in its teens. It arose when many of my younger auditors were discarding their knickerbockers for trousers. That minute organisms or germs were the cause of very many diseases had long been suspected, but until twelve years ago we were not at all certain that the process of inflammation and the formation of matter or pus, or that many well known diseases were the result of such germs. Now we know not only that they are the cause of all inflammation, but scientific investigation has shown us that all suppuration, pneumonia, lock-jaw, diphtheria, erysipelas, leprosy, tuberculosis, and a host of other diseases are due to these minute vegetable germs. You can easily understand that only the first elementary facts have been ascertained and by no means all of these. Here is a whole new science awaiting patient investigation and brilliant Who that has ambition and enthusiasm is not discovery. aroused by such a prospect?

How is it that these minute germs produce their malign influences? We know that they secrete or in some way produce certain deleterious poisons in the human body, but how these or the bacteria act we do not know. When we learn just how they act, in all probability we shall be able soon to discover the means of counteracting their harmful effects. The problem how to destroy the bacteria without destroying the patient is one which we have not yet solved. We know that they produce infection. We know fairly well how to prevent their entrance into the body in surgical cases by the careful antiseptic cleansing of the person of the patient, of the instruments, sponges. dressings, hands, everything which comes in contact with the wound. But in many instances cases are brought to us already infected. A man who has met with any accident has an infected wound, and if any time has elapsed his system has become infected. We are as yet groping for methods by which we can surely overcome such a previously established infection. Here. you see, is another field for scientific activity and the most beneficent results.

We are learning how to prevent typhoid fever, tuberculosis, and other medical diseases, but have not even yet begun to learn how to prevent the entrance into the system of the bacteria of pneumonia, influenza, and other similar diseases.

Again, there are certain half-discovered facts which already give us glimpses of unsuspected triumphs. Within the last few years it has been found by experiments on animals that the germs of certain diseases when inoculated, for instance in a rabbit, from that to a second, a third, and so on, become intensified in their action; whereas if similarly inoculated in one monkey after another they become diluted and weakened in their action. How or why does the virus or germ become stronger by transmission through a series of rabbits and weaker in its transmission through monkeys? How can we utilize this for the benefit of humanity? Here is another problem awaiting its Newton or its Morse.

Again, we know that there are animals in which we cannot produce certain diseases. For instance, the attempt has been made scores of times to inoculate cancer into the lower animals without success. They do not suffer from measles or scarlet fever, whooping cough or mumps. There are also diseases peculiar to certain animals which man does not take. We know very well that there are some human diseases from which certain persons are exempt. For instance, people have grown up from childhood, been exposed to scarlet fever, or measles, or small-pox, and yet have not taken it. These animals or people have what we call a "natural immunity" to these diseases. Thus far preventive medicine has only attacked one disease in the way of producing an artificial or "acquired im-This is vaccination by which immunity against munity." small-pox is produced; or, in other words, a vaccinated person can be exposed repeatedly even in epidemics of small-pox without contracting the disease. With such a striking example before us for over a century, how strange it is that it did not suggest experiments in the same direction in other diseases.

But at last this hint has been taken and it promises much in the future. For instance, it has been discovered that if we inoculate an animal with the germ of lock-jaw, the most virulent of all bacteria, and then take the watery part of the animal's blood—the blood serum—and inoculate another animal with it, the second animal may then be inoculated with the germ of lock-jaw without becoming the victim of the disease; in other words, in the second animal there has been produced an acquired "immunity" against the disease. Even if the lock-jaw had already attacked the second animal, this blood-serum, it was found, would vanquish the disease. Here we come to one of the most striking recent results of scientific investigation. Once that it had been tried sufficiently often to determine that this mode of conferring immunity or of arresting the disease was not deleterious to the animal, it was deemed right that the same attempt should be made in man to cure this dreadful disease, and within the last three or four years there have been recorded nearly a score of cases in which patients suffering from violent attacks of lock-jaw have been cured by inoculation with the blood-serum from such an animal. This immunity or cure is supposed to come from some antidote, or, as it is called, "antitoxin," produced in the first inoculated animal and introduced into the body of the second animal or of man with the blood-serum. Think you that it will be no great service to humanity, no great scientific feat, which will fill one's mind with a wondering, never-ending satisfaction, and crown his life with fame, when this problem is fully solved? What extraordinary results it may lead to we can as yet only guess at, but its possibilities seem magnificent. At this very moment Dr. Haffkine is in India inoculating people with the antitoxin of cholera and bids fair to succeed in his efforts to limit or prevent this fearlul plague.

You have all heard, of course, of Koch's tuberculin. This consists of a modification of the ptomaines or poisons produced by the little bacillus or germ which causes tuberculosis or con-

sumption. You know how the discovery was prematurely announced and heralded by the newspapers and then fell into disuse, and has been the object both of obloquy and ridicule. As a matter of fact, it is still being used in other modified forms by physicians and surgeons, and it is not too much to say that we have gone a long way towards finding the means by which we shall probably within the next few years cure consumption and all the other baleful effects which follow from tuberculosis. And when I tell you that there is not an organ in the body which is not affected by tuberculosis, and that it is the cause of far more suffering and more deaths than any other disease, you will appreciate the immense boon its cure will be.

And please note that these instances which I have given of lock-jaw and of cholera and of consumption are but types of a series of investigations in the antitoxins or natural antidotes. This opens the door to a wholly new class of remedies furnished by our very foes, on which a large number of experiments are being constantly made.

The fearful ravages of cancer are familiar to all. Its cause is unknown, its cure compassed only by its early extirpation, and even then, I must regretfully confess, but rarely. But within the last year research has seemed to show that we are on the verge of the discovery of its cause, and if so, time will give us its cure. Who of you would not rather make such a discovery than be the father of the Atlantic cable or the successful general of a great' war? Who would be so blessed by future millions of mankind as the discoverer of such a boon to the whole race?

Within the last two years also another class of remedies has been introduced, especially in connection with a disease with which you are probably not familiar, known as myxœdema. You all doubtless are aware what goitre is. Until lately it was scarcely deemed amenable to operation, but modern surgical methods have so improved that several hundreds of cases have been reported in which the goitre has been removed, and the patients have nearly all recovered. But after these operations a

curious and unexpected result was found. Goitre consists in the enlargement of a certain gland in the neck called the thyroid gland. If the whole of this gland either in health or disease is removed, a considerable proportion of such patients undergo a sort of elephantine growth all over the body. The features become thick and clumsy, the fingers and toes swell to twice or thrice their ordinary size. The mental condition also degenerates into a form of cretinism. This misfortune attending the complete removal of the gland led, first to a modification of the operation, viz., the partial instead of the total removal of the gland; even a little of the gland if left, it was found, would prevent such a bad result. But it has done more than this. Victor Horsley, in England, suggested that in cases in which, as sometimes occurs, this disease myxædema, arose spontaneously, the thyroid gland itself might be used as its best remedy. Accordingly first it was used surgically. The thyroid gland was removed from a sheep and transplanted under the skin or into the abdominal cavity of the patient. and so long as it remained the patient was bettered; but experience showed that the gland soon disappeared and the betterment vanished with it. Then an extract was prepared from the gland and used hypodermatically. This gave still better results, but it was suggested again that if the patient were simply fed on the gland itself (it is one of the sweetbreads of the body) cure might follow; and within the past year a large number of cases have been reported which have been cured by this wholly new method of treatment. See then here another fruitful field of research in the administration of various remedies derived from particular glands or other structures in the animal body. Already such an extract from the brain has been used in epilepsy, but it is too early as yet to say whether the result will prove to be good or not. Within a month, Vaughn of Ann Arbor has also called attention to the fact that the extract of the thyroid and other glands is fatal to bacteria. This new discovery may lead to the most beneficial results.

But what we do not know in bacteriology is far, far greater than what we do know. The bacteria of scarlet fever, of measles, of small pox, of whooping cough, of typhus fever, rabies, and many other diseases are as yet unknown and awaiting your touch, your investigation. If you miss your chance, others will seize it.

If I were to ask any one of you whether Anatomy, Physiology, and Chemistry are comparatively complete sciences, I suppose you would answer unhesitatingly, yes. On the contrary, they are most incomplete. We know to a fair extent the gross anatomy of the human body, although even here there is an immense deal to be learned; but the minute anatomy is not well known, and there is scarcely an organ in the body whose physiology has been half studied. Even so common a substance as the white of an egg has defied the chemists, and the analysis of ninety-five per cent. of the solids of the body is imperfect. Yet this is fundamental Physiological Chemistry.

When I first taught anatomy, the great divisions of the brain into two hemispheres, the cerebrum, the cerebellum, etc., were of course known, but the various convolutions of the brain surface were deemed to be simply fortuitous by the anatomist, the physiologist, the physician, or the surgeon, and that one convolution had no more value than another. Investigations in the last twenty years have definitely mapped out the brain, showing that the convolutions and fissures are not arranged hap-hazard. but on a definite plan. A portion of the brain at the back of the head and a little at the side of the head are fairly well known, well enough indeed for the successful performance of extraordinary operations in diseases and injuries of the brain. But all the rest of the brain is as yet almost a terra incognita an Africa standing expectant for its Stanley. Here again is another problem seeking solution, a problem which is enough to arouse the scientific ambition of any enthusiastic mind.

Again, it is only within the last five years that an accurate knowledge of the relation of diseases of the ear to diseases of

the brain has been recognized, and their scientific surgical treatment begun. The splendid results already achieved give promise that within a few years we shall know not only how to cure brain disease the result of disease of the ear, but what is far better, how to prevent it.

The anatomy of the nerves has been known for many years in its gross outlines, but the problems which present themselves here are many and varied. Cut a certain nerve, the ulnar, which supplies the inner part of the hand, and the results are not the same in all patients. You may abolish touch and yet pain will remain. You may even, as I have seen within the last few weeks in several cases, cut out one to three inches of the sensitive nerve of the face, and it will be reproduced, and with this the frightful pain of tic douloureux, for which the nerve was removed, will return. On the other hand, by a wound or an operation from one to three inches of a nerve may be removed, and you want the nerve to be reproduced and so reestablish sensation in the skin supplied by it and motion in the muscles to which it goes, and the nerve steadily refuses to reproduce itself. Why in the one case it will and why in the other case it will not reproduce itself we do not know. In fact, what we do not know about nerves alone would make a goodsized book.

Thirty years ago when we looked at an eye all we knew was what we could see on the outside. The trouble was that nothing could be seen inside of the eye, although there was such an inviting window in front of it by which we could look in, because the interior was totally dark. But it occurred to Helmholz that if by a little bit of looking-glass he reflected light into the eye and then scratched a little hole in the quicksilver, he could look through the hole into the illuminated interior of the eye and see all there was inside of it. From this simple idea has arisen the ophthalmoscope, by which the whole medicine and surgery of the eye have been revolutionized, and great light has been also thrown on the diseases of the brain.

Again, when the mouth was opened, we could see certain parts, but the whole interior of the larynx and windpipe was beyond our sight and therefore beyond our knowledge. But soon after the ophthalmoscope was discovered Czermak and Türck found that if a little mirror were held in the back of the throat at an angle of about forty-five degrees and a ray of light were thrown upon it from a small perforated bit of looking-glass, the interior of the throat like the interior of the eye would be illuminated, and we could look through the little hole in the looking-glass and see the reflected image of the vocal chords and the whole of the larynx in the mirror.

Similar inventions await the ingenious investigator of the future for the examination of other cavities and organs of the body, and the day is not far distant when we shall be able, I hope, to see and therefore to know the interior of the stomach as well as we do the exterior of the body. That this will illuminate our own minds as well as the stomachs of our patients is certain.

And so I might go on in one department of medicine after another, presenting to you similar problems, some of them so technical that they would not be suited to a non-professional audience, and in each show you the vast need there is for bright, minds. Has the last word been said in surgery, in medicine, in the diseases of any of the special organs of the body? Nay, verily we are but at the alphabet of investigation and of cure. Great as has been the progress in the last fifty years, greater I venture to say than in all previous time, I believe that the next fifty years will far eclipse the discoveries of the past fifty. Who could have predicted the rise of Bacteriology a score of years ago? And who will venture to say that in the next twenty years another science equally far-reaching, equally beneficent, equally brilliant in its achievements, may not arise? Even the present is a splendid time,

"An age on ages telling
To be living is sublime."

But the twentieth century in which you will live will be the most glorious time of all the ages. But you may take part in this grand march of progress, not only in the rank and file, but as a leader if you will but write. Or it may be, if you have the gift of imparting knowledge, you may be one of the teachers of medical science, an enviable post of honor and responsibility but also of unequalled enjoyment.

Have I not put before you enough to arouse the ambition, the energy, the benevolence, the enthusiasm, of any young man about to choose his career? Can there be in any other department of human knowledge so fine a field for research, for discovery, for fame, and what is far better, for serving the human race? If, in consequence of what I have said to you, some of you will select Medicine as your chosen pursuit, rest assured that if you will faithfully perform your duty, at the close of life you will have the pleasure of surveying a career which has been advantageous to yourselves, has been a means of doing good to your fellow men, and I verily believe has approximated as near as possible to the Divine Life as is given to any man to do.



ALUMNI ORATION, 1807.

The Sciences and Modern Languages in the College Curriculum:

AN ADDRESS

Delivered in the Auditorium of Pardee Hall, before the Alimon, Truste-

EAPAYETTE COLLEGE.

June 32, 1847.

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THEOPHILUS PARVIN, A.M., M.D., LL.D.,

A Manuber of the Class of '47, and Professor of Obstetrics and Discuss of Wisson, and Children in the Jefferson Medical College.

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LAFAYETTE COLLEGE.

June 22, 1897.

—ву—

THEOPHILUS PARVIN, A.M., M.D., LL.D.,

A Member of the Class of '47, and Professor of Obstetrics and Diseases of Women and Children in the Jefferson Medical College.

Honorary Fellow of the Edinburgh Obstetrical Society, and of the Berlin Society of Obstetricians and Gynecologists. Formerly President of the American Medical Association, of the American Academy of Medicine, of the American Gynecological Society, etc.

REQUESTED FOR PUBLICATION BY VOTE OF THE
ALUMNI ASSOCIATION.

EASTON, PA.; CHEMICAL PUBLISHING COMPANY. 1897.

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The Alumni Association of Lafayette College.

The Alumni gathered at eleven o'clock on June 22d in the auditorium of Pardee Hall. In the absence of Rev. William C. Alexander, D.D., '73, of Washington, the president of the Association, the vice-president, Rev. James W. Gilland, D.D., '77, of Brooklyn, took the chair. A. A. Tyler, Ph.D., '92, of Columbia University, was appointed temporary clerk. The following officers were chosen for the ensuing year:

President—Rev. J. W. Gilland, D.D., '77, Brooklyn. Vice-President—Rev. L. W. Eckard, D.D., '66, Easton. Secretary and Treasurer—Prof. S. J. Coffin, '58, Easton.

Executive Committee—Dr. McC. Radcliffe, '77, Chairman, Philadelphia; P. C. Evans, '74, Easton; A. C. LaBarre, '82, Easton; J. R. Strawbridge, '82, York; Dr. C. P. Bassett, '83, Newark, N. J.; S. R. Park, '84, Easton; John E. Fox, '85, Harrisburg.

David W. Nevin, '75, reported progress in the construction of the Pardee Memorial Gateway. The money received has been expended, and all work now performed has been paid for. The committee hopes to be able to complete its work on the entrance to the college grounds this year.

Edward J. Fox, '78, presented the report of the Executive Committee, with the suggestion that the Association adopt some plan to simplify the nomination of Alumni Trustees. The report was adopted and the latter matter was left in the hands of the new committee to arrange.

The Necrological roll, comprising twenty-one names, was read, and Rev. G. L. Shearer, D.D., '57, New York, J. R. Dickson, M.D., '77, Gettysburg, and Ralph Steans, M.D., '87, Mifflinburg, were appointed a committee to draw up a minute in reference to the recent decease of Prof. Traill Green, M.D., LL.D.

The Trustees and Faculty were announced, whereupon the annual oration was delivered by Prof. Theophilus Parvin, M.D., LL.D., of '47. On motion of John E. Fox, '85, of Harrisburg,

seconded by P. C. Evans, '74, of Easton, the thanks of the Association were tendered to the orator of the day, and his address was requested for publication, a copy to be sent to each contributing member.

The alumni then dined in the Electrical Laboratory, after which the classes of 1857, '72, '77, '87, and '94 held their appointed meetings, which were largely attended and very enthusiastic.

In its report of the Commencement, the Philadelphia *Ledger* said: "Regularly attending Alumni say with one accord, it was the most successful in the old institution's history."

The class which graduated was one of conspicuous scholarship. The year's record of success in contests in athletics and debate was remarkable. The report of the College's financial condition was gratifying. In every way every lover of Lafayette had reason to rejoice.

This has since been increased by the registration, on the next day, of more candidates for the next Freshman Class than have registered on the corresponding day in any recent year. So the College is not only looking backward with pride, but forward with quickened hope and growing confidence.

Address before the Alumni Association.

Mr. President, Ladies and Gentlemen:

When a boy I read the burial of the son of the President of a Pennsylvania College, and, as classmates were carrying the body of their dead friend and companion to that narrow house appointed for all the living, yea, to "God's field sown with the seeds of the resurrection," the father said, "Tread softly, young gentlemen, for you are bearing precious dust."

Looking back through more than half a century, when at twelve years I entered as student in Lafayette, and finding of those then teachers not one living, and so few of the taught who remain this side the river, the thought comes, how softly, how silently and sadly one treads amidst the dust and ashes of the dead!

"My thoughts are with the dead; with them
I live in long-past years;
Their virtues love, their faults condemn,
Partake their hopes and fears,
And from their lessons seek and find
Instruction with a humble mind."

But, my brothers of the Alumni, you have called me to a duty in the living present, and not to the recountal of mournful memories. Your call was sudden, not an hour given for decision, and thus in striking contrast with the conduct of the Venitians, as narrated by Machiavelli. These people had a bell called Martella, which was rung during a whole month before the forces left the city, in order that the enemy might provide for his defense; so great was the virtue that existed amongst men, and with so much generosity of mind were they governed, that as it is now considered a brave and prudent act to assail an unprovided enemy, in those days it would have been thought disgraceful, and productive of a fallacious advantage.

Less than a month has passed since your Martella warned me that I must stand here this hour, and make defence in the discharge of an assigned duty. It is an illustration of substitution; the substitute fills an unexpected gap, but possibly he may make other gaps, or others gape!

The question which I have been desired to answer is, what instruction should be given in the college to those students who intend entering a medical school?

Before presenting my own views, there will be read letters from two of the ablest and most eminent men in the American profession, whom I regarded as especially well qualified to give opinions upon the subject, and from whom, therefore, opinions were asked, Dr. Sternberg, Surgeon-General of the United States Army, and Dr. H. C. Wood, of the Medical Department of the University of Pennsylvania.

WAR DEPARTMENT, SURGEON-GENERAL'S OFFICE, WASHINGTON, June 14, 1897.

Dr. Theophilus Parvin, 1626 Spruce Street, Philadelphia, Pennsylvania.

DEAR DR. PARVIN: If my views can be of any use I am very glad to give them to you in an off-hand way, but I have not time to consider the matter fully.

Certainly Biology, French, and German should be considered as among the more important studies for a young man who intends to pursue the study of medicine. A course in Biology, such as is given at the Johns Hopkins University should be of very great value to a medical student. He becomes familiar with laboratory methods and with the exactions of modern science with reference to the experimental demonstration of any new method or fact.

French and German are important because many valuable researches are published in these languages, and one who is not familiar with them has to be satisfied with the brief abstracts published in our home journals.

The medical student will hardly have time to acquire a satisfactory knowledge of Greek; and French and German are so much more important for him that he will do well to take these modern languages in preference to Greek or to the higher mathematics; but he should have an outline knowledge at least of Botany and Zoology in all their branches, also of vegetable Physiology and Pathology as a preparation for the study of animal Physiology and Pathology.

The student of medicine must, of course, know some Latin, but, in my opinion, if he caunot have a thorough knowledge of Latin and also of French and German, he will do well to give the greater portion of his time to the modern languages.

I think you will do well also to impress upon the young men who propose to study medicine the importance of having a thorough knowledge of English. I find that many graduates of leading medical colleges who really are well founded in their medical studies write very bad English

making sometimes gross mistakes in their grammar and especially in the construction of their sentences. This puts a man at a great disadvantage no matter how skillful he may be as a physician or a surgeon, for an educated man who detects such mistakes in a letter or paper is apt to conclude that the writer is an ignoramus.

Trusting that these few notes will answer your purpose, I remain,

Very sincerely yours,

Geo. W. Sternberg.

1925 CHESTNUT STREET, PHILADELPHIA, PA.,

[Dictated.]

June 16, 1897.

My DEAR DR. PARVIN: My views upon College education for physicians are perhaps too radical to suit any one, but as they have been formed after thirty years of experience in teaching, and have been crystallized by the very careful consideration forced upon me by the fact that I had two sons to educate for medicine, they may be stated for what they are worth.

The gist of them is that the last two years of the ordinary college course are such a waste for the medical candidate that no one holding the views that I do would allow his son to finish his college career. Perhaps my reasons can be most briefly stated by giving my own case.

My sons entered college at the ages of seventeen and eighteen respectively. The boy of eighteen would finish his college career at twentytwo. A proper medical education cannot be obtained under seven years; so that the young man would be twenty-nine before he could begin to attempt to practice medicine, which is in my opinion entirely too late. Having made up my mind that twenty-seven was the latest age to be tolerated for the beginning of a medical life, the question was whether the two years should be taken off the college life or off the medical education. I unhesitatingly decided that it should be taken off the college life, and therefore gave the boy two years at college, four years in the Medical Department at the University, a year and a half as Resident Physician in the Hospital, and a year and a half in Europe, accomplishing this at a cost which was practically the same as would have been required if I had kept him in the more ordinary track. For general culture, for knowledge of the dead languages and high mathematics, two years in college certainly suffices for the foundation. The view that the human mind can only be trained by a study of the dead languages is, to my mind, simply a survival of a mediæval fetich. I know the evidence of the German Commission, which has been so much quoted. The fallacy is simply that it is the method of teaching rather than the subject taught which influences the mental training; and that the method of teaching at the time of the Commission was much better in the classical institutions than the scientific schools. It should be distinctly understood that the educational year and a half in Europe, which I have given my son, had for its accomplishment not simply the acquirement of more medical knowledge but of real knowledge of that which is pretended to be taught in most of our colleges but which from the very nature of our college courses cannot properly be taught. I refer to the modern languages. If a proper foundation has been laid, a year and a half in Europe ought to enable a young man to learn to speak two modern languages, and it has never been my lot to find a college graduate who could speak any language but his own, unless his knowledge had been acquired outside of the college.

A fallacy which underlies almost all collegiate judgment as to the effect of methods of education, is that the judgment is founded upon the facility of passing brilliant examinations, a power which has very little relations with the power of doing in after-life. In thirty years I have never known the head of a medical class reach distinction, so far as my memory serves. One man could have done it if he had not drank himself to death.

If the desire for a degree must influence the parent to sacrifice his boy's future practice to some extent for the college education, the nearer the last two years of the college course are brought into unison with technical training by the study of modern languages and by biology, the less a boy's time will be wasted. The first reform needed in the College course is a shortening of the term; two years of the present A. B. course in its general aspects, one year of biological scientific training, and then entrance into the medical course. The attempt which has been made at the University of Pennsylvania to meet the difficulty by allowing the biological student to enter the second year, so as to shorten the medical course, is in my opinion a serious mistake, into which the medical faculty was persuaded some years ago by its desire to help the Biological Department of the University. It is, of course, very difficult to alter an inaugurated system, but I do not believe it would be entered upon at present.

As corroborating my views I also call attention to the fact that our socalled "College Departments" of the American University are largely upon what might be called a fraudulent basis. In their successful subdivisions they are practically technical schools, in which the basis of education is as I would see it in medicine, namely two years of general College education, followed by two years of technical training; the whole ending in a single degree. At the University of Pennsylvania, with which I am most familiar as an institution, the College Faculty gives ten courses, of which Number I is the course in Arts and Sciences; nine of the courses are absolutely technical, covering nine, or I believe really ten, distinct professions. In the Arts and Sciences, according to the catalogue of 1896-97, there were 175 students in that course, whilst in the professional courses, labeled as the College Department, there were 742 students. It is plain to my thinking that the public, whatever may be said by college presidents and college professors, is recognizing the real value of the courses in Arts and Sciences; and that the university which will in the near future command success is that which reduces the College education proper to two years and then gives technical courses.

In conclusion, may I ask you to pardon any seeming dogmatism or

egotism in this letter as produced by the need of brevity. It would require a whole address to properly develop my ideas in a becomingly modest manner.

Very truly yours, H. C. Wood.

DR. THEOPHILUS PARVIN. PHILADELPHIA.

If the question now considered had been referred to ancient philosophy, the answer would have been a negative; and coming to modern times the learned Cardinal Newman, that great master of profound thought, and of vigorous speech, would have utterly rejected from university education such studies, telling us that knowledge is its own end. But, on the other hand, Lord Bacon would give hearty approval, for those studies "bear fruit," exclaiming, "Is truth ever barren? Shall we not be able thereby to prove worthy effects, and to endow the life of man with infinite commodities?" "Knowledge is a rich storehouse for the glory of the Creator, and the relief of man's estate." Locke would assert that the study of the sciences is a necessary part of education, because of its utility, and the spirit of Paley, admitting his theory of morals, leads to like conclusion.

Admitting the value of Latin and Greek in mental culture and discipline, and that as Swift has shown in his Battle of the Books, the ancient classics have given us a rich supply of the two best things in the world, sweetness and light, the advance in natural science, especially in the last half century, opens a new world of marvellous knowledge so vast, so important, ministering so abundantly to human needs, a liberal education must include its study; indeed, as observed by Harris, the investigation of nature is the characteristic intellectual activity of modern civilization.

After these general remarks, let me state what seem to me important subjects for the college student preparatory to the study of medicine, making some comment, short or long, upon each as presented. The first of these studies is English composition. A man does not know what he knows until he tries to tell it, and to tell it in such a way that others can readily understand, so that as a mental discipline, as a qualification for future usefulness, the prospective medical student will give diligent attention to this branch of college education.

The practice of writing will correct errors of orthography, which are sometimes sins of doctors, as mentioned by Dr. Sternberg.

In a letter from Mrs. Cæsar, of London, to Dean Swift, I find the following sentence, suggesting that her ladyship's orthography was not the best: "Mr. Pope tells me that I sometimes put too many letters in a word, but never too many words in a letter." Such combination of compliment with criticism has rarely been equalled.

An Edinburgh doctor, who by his story of "Rab and his friends," made the world his debtor, said, "The turbid, careless style, constipated, or the reverse, by which much of our medical literature is characterized, is a disgrace to our age and to the intelligence, good taste, and good breeding of our profession, and mars inconceivably the good that lies concealed and bungled within it." Though forty years have passed since the late Dr. John Brown wrote these lines, very much of medical writing to-day is far from being what it ought to be.

Let me present a few examples of doubtful or damnable medical English, possibly after the manner of the Spartans, who at certain periods made Helots drunk in order that Spartan youth might abhor the vice of drunkenness. One doctor writes of "harping eternally" upon a particular operation. Where the eternal harping is there will be no need for any surgical operation. Another doctor says, "the question must be envisaged from a calm and deliberate standpoint," etc. Remembering the meaning of envisage, one asks, what intuition has to do with a calm and deliberate standpoint? Rousseau said, "Every one but a fool or mathematician will use metaphors," and doctors, belonging to neither class, use metaphors; but let them see to it that the metaphor is single, not plural, not "mixed." One of the ablest of American medical writers uses these words, "When we glance at the progress of the century, dare we not say that at least the beacon fires of hope have been lighted?" Beacon is primarily and chiefly a signal of danger, and not a sign of hope or of progress.

One recently has read: "He 'blazed' more than one new 'trail' in the forests of surgical ignorance." What marks on trees have to do with trace, or track upon the ground, is proba-

bly as obvious as the relation between the dressmaker's work and the shoemaker's. The man partially restored to sight by our Savior, saw men as trees walking; but if this metaphor were correct, one would see men walking on the sides of trees.

A young doctor, "piping hot from his medical studies," told an old physician of a wonderful rhinoplastic operation he had witnessed; to the inquiry of the latter, as to whether the nose was a good one, answered, "it was not a nose, but a lip that was made by the surgeon."

To write well one must think well, just as Whately said to the student who asked how to write clearly, think clearly.

Of course suitable reading contributes materially to acquiring a good style, only that style must be one's own, not an imitation. Addison, if we bear in mind the great Dr. Johnson's advice, will be thought the best teacher. But you will find in Dean Swift much of the strongest, clearest, best English. You will read De Ouincey, not only for the beauty of style, but to observe the nice discrimination in shades of meaning—he was an artist in words—in selecting words, and also to observe the admirable manner in which words are arranged in a sentence he was a great general, putting every soldier in the place he belonged, could be most effective. You will read the stately periods of Macaulay, and then lest you may be betrayed by either of the last two into a diffuse style, you will go to the Sage of Concord, and listen to his terse, sententious utterances. You will always remember what Ruskin said: "Certainly it is excellent discipline for an author to feel that he must say all he has to say in the fewest possible words, or his reader is sure to skip them; and in the plainest possible words, or his reader will certainly misunderstand them."

Moreover, let the Bible be studied by him who seeks to acquire a good style of composition—not indeed in all parts, not the joyless genealogies, or weary Chronicles; and I would prefer the words of the great Teacher himself, and the narrative of John to much that Paul wrote, in order to learn simple, plain composition.

I have sometimes thought that our speech can be strengthened by observing the language of common people, especially if this be uttered under the influence of strong emotion. A father whose daughter had been almost as near and dear as Antigone to Oedipus, that daughter suddenly dying just when life was full of joy and hope, met, in one of his visits to her grave, a poor mother of the common people, a mother who only a few weeks before had put her infant at rest in the same graveyard. And she, knowing how many years his daughter had been sleeping there, in anxious surprise asked, "Does it hurt yet?" How much those four monosyllables meant, and how much they suggested!

And again. It is not rare in some families, usually of the plain people, for a husband to address his wife as mother, and she him as father. Possibly there is a deeper meaning in the terms thus used than generally believed.

"All thoughts, all passions, all delights, Whatever stirs this mortal frame, All are but ministers of love, And feed his sacred flame."

And they twain become one. But after a time that united love is incarnate, and she sees in the new being bone of her bone and flesh of her flesh; and without abating a tithe of the loyalty and affection which she gave in her maiden beauty and purity to the lover, she now beholds in him the father of her child, and so calls him, as if thus he was more sacred, having a higher relation than ever before. And he, with corresponding sentiment, sees her in a new light, and in a new life, and though he may never have read Coleridge, feels in his heart,

"A mother is a mother still, The holiest thing alive."

Go to the common people, and let them teach you now and again the beauty, the meaning, and the might of simple words.

I pass to the second topic, to wit, the importance of studying French and German in the college course. You will not have time for these studies while attending medical lectures or after entering active life; and besides, the longer delayed the more difficult the acquisition of language. I will not insist upon being able to speak either or both readily, though that is best, but at least you should be able to read them with facility.

One of the greatest of Oxford teachers of this century, to whom most of us are indebted for what knowledge, great or

small, we have of Plato's writings, jestingly suggested a motto for the gates of hell, *Ici on parle Français*. I do not know if this motto were accepted by his Satanic Majesty, that the demand for teachers of French would be greatly increased, but it is to be taken for granted that none here would give such reason for studying the language.*

Crabbe Robinson suggested as objections to the German language, that there were too many words in a sentence, too many syllables in a word, too many letters in a syllable, and too many marks over a letter. Some of my own objections I made in a cabin "talk" a few years ago on a ship, that has now been lying for nearly four years at the bottom of the ocean, the Elbe, her captain, the noblest, best, bravest sea captain of the many I have known. Among these objections was the care of rats by the Germans, for is not one of the largest and most imposing buildings in every city the Rathhaus? The German has such bad taste, he wears a Hut on his head, and is so unhygienic in his views that going to the bath is going to the Bad.

Moreover the language is cruel to sick people. We are accustomed to say of man or woman whose mental machinery is "out of gear," "a screw loose," it may be, that he or she is a crank, but with the Germans every sick person is a krank, and a hospital is nothing but a house of kranks, a Krankenhaus.

Worse than any or all, the language is profoundly irreligious according to most creeds, for it makes light of hell!

But pleasantries aside, the Germans, as Harris justly states, are a knowledge-loving race, and he who would keep abreast in medical progress ought to have a reading-knowledge of their language.

Psychology should engage the study of the college student. The human being is soul and body, and the two act and react reciprocally. The doctor who knows nothing of mind is not half a doctor.

* Milton has made a statement which to many would make it more attractive than the suggestion of Jowett as to the language there spoken:

"Let none admire
That riches grow in hell, that soil may best
Reserve the precious bane."

There are men so greedy for riches, so grasping and avaricious, that if they could they would tear the silver lining from every cloud to have it coined into dollars, 16 to 1, and who could not be trusted in the New Jerusalem, for they would try to break up the golden pavement and convert it into current coin.

Let us believe, as a famous doctor has said in his Religio Medici, that "There is surely a piece of Divinity in us; something that was before the elements, and owes no homage unto the sun. Nature tells me. I am the image of God, as well as Scripture. He that understands not thus much hath not his introduction or first lesson, and is yet to begin the alphabet of man." That doing, the work of the physician becomes more intelligent, nobler, and his life rises above that of a mere dispenser of drugs. Drugs! How one wearies of the rapid multiplication of so-called remedies, probably a thousand new preparations brought before the profession in the last ten years. The cunning of the chemist and the cupidity of the manufacturer are overwhelming us with means for the cure of diseases, so that now it is almost a crime for a sick person to die. As mind is studied more and more the medicine of the future will become more spiritual, less material, though one may now hesitate to fully accept the following statements made by Peyton in his Memorabilia of Jesus: "Establish a more magnetic sympathy with the unseen world, get a more copious flow of the life of God, acquire more spiritual capacity, and you will act upon the lunatic, and the epileptic, and the paralytic, with healing virtue. Are the virtues of plants and minerals more powerful than the sympathies of mind? Surely the spirit can act on tissue directly to finer issues than chemical molecules, if we only had the higher conditions of the spirit."

The phenomena of disease are often spiritual quite as much as material; indeed the very word disease, disease, suggests a mental, not a physical condition. The mother knows her child is ill oftener from the change in disposition and conduct than from bodily state; and here let it be remarked, love quickens her observation and perception, and helps her promptly discover disorder, and so too, the doctor is best, who not only loves his profession, but above it loves humanity.

To know how to think is one of the greatest intellectual triumphs. It enables us to reason correctly, it helps us in the detection of falsehood, and the recognition of the truth; it prevents us from confounding the accidental with the essential. Words vary so in meaning that the accurate knowledge which comes from the study of mental phenomena is essential. I have

a surgical friend who is enthusiastic over an admirable lithotrite known by his name, and I can imagine him talking to a professor of mathematics upon different varieties of calculus, upon the merits of median, lateral, and supra-pubic section, and lithotrity. The professor gravely replies, "I understand conic sections, but those you refer to are not included in them; I know only two kinds of calculus—differential and integral—and my trouble has been in getting calculus in, not out; indeed I have occasionally found some skulls so thick that I despaired of causing calculus to enter the head, unless by means of the instrument proposed by Sidney Smith, for getting a joke into a Scotchman's head—the trephine."

Were St. Augustine to walk the streets of Rome, and hear an ardent medical student speak of a "fine clinic," I imagine the venerable father would be startled, and possibly exclaim, "Has that youth been at the bedside of a person supposed to be dying, and witnessed his baptism and reception into the church? I have seen more than one fine clinic, whose repentance seemed sincere, and conversion thorough, but after being received into the church, he recovered, and went back to the beggarly elements of the world. Constantine was a clinic, but dying so soon after his baptism, God only knows if he was thoroughly converted. A modern poet who did not, however, write with the grace of the Mantuan bard, or with the sweet simplicity of Horace, I have been told is the author of lines that seem to me quite truthful:

"God and the doctor we alike adore, But when in sickness, not before; The sickness o'er both are alike requited, God's forgotten, and the doctor's slighted."

"And so I judge it is too early to speak of a 'fine clinic' before there is conclusive test of the genuineness of the conversion." Possibly too, sometimes, the fine clinic in its modern use, may prove anything but good in its result. Bold operation, big fee, but prompt funeral.

Not merely words, but even letters have different meanings. You read D.D. after the name of a clergyman, and of course you recognize the title as Doctor of Divinity; but these same letters after the name of a prisoner in a police station, stand for "drunk

and disorderly." "W. C." on a roll of ministers means without charge, but attached to Miss Flora McFlimsey's name, they probably signify without clothes. I knew of a druggist in Philadelphia who, many years ago, having to fill a prescription in which the doctor had directed the medicine for a young lady to be given pro re nata, brought down upon himself the just wrath of the whole family, by a literal translation of the Latin.

One source of sectarianism in medicine is inability to reason correctly. A common error in medical experience is mistaking the post hoc for the propter hoc, and attributing to a drug that which occurred by the sole force of nature, the recovery of the patient. A great Scotch doctor, Cullen, said that there were in medicine more false facts than false theories. Admitting the statement true, there is needed a mind thoroughly disciplined in order not only to detect false facts, but also false theories.

A recent writer* in *Education* has wisely said, "There is no profession in which there is more need of all the qualities that go to make up the thinker than the medical profession.

Biology ought to be a part of the student's preliminary training. This is an interrogation of nature in a way, with a wideness, and with a fecundity of results that Lord Bacon in the wildest of dreams could not have anticipated, when he uttered his important injunction.

The biological student is taught how to observe accurately, and this power of observation is one of the essentials in medicine; even some have held it simply a science of observation.

The student is also taught cleanliness and neatness. As he reads more of nature's handwriting in the lower order of existences, discovers for himself her matchless marvels, animal creation is revealed to him in a new light, and evokes new sympathies in his heart. These are the incidental advantages of biological study common to all; but the medical student is so much better qualified for entering on the study of man in his anatomy, man in his physiology.

The treasures of science that are offered you, better "than the wealth of Ormus or of Ind," and chiefly achievements of comparatively a few years, are vast and almost dazzling in brightness, and lo the sun is not yet fully risen.

^{*} Rev. Dr. Thwing.

Finally, let me urge the cultivation of the imagination. One of the criticisms of the study of the classics was that they led to the development of this power. Let that be its chief glory, and do not banish Greek and Latin from the college course.

Emerson recognized the power of imagination in science, stating that the latter did not know its debt to the former. "Goethe did not believe that a great naturalist could exist without this faculty. He was himself conscious of its help, which made him a prophet among doctors. From this vision he gave brave hints to the zoologist, the botanist, and the optician." Buckle, in one of his most valuable papers, asserted that if the imagination had been more cultivated, if there had been a closer union between the spirit of poetry and the spirit of science, natural philosophy would have made greater progress because natural philosophers would have taken a higher and more successful aim, and would have enlisted on their side a wider range of human sympathies.

The imagination makes the student of science a prophet, and he foresees the law before facts establish it. Thus, as James Freeman Clarke said, Kepler and Newton had a vision of the harmony in the heavens, of vast laws regulating the movements of the planets years before they were able to demonstrate them. The science of crystallography was founded by a man whose soul was filled with the love of beauty, and because of this living love he discovered the primary laws of the formation of crystals.

That man learns a science most readily who is most expert in making pictures, and that teacher communicates knowledge best whose pictorial power is greatest.

Sometimes a teacher is a mere Gradgrind, having nothing but facts, and drilling them into a scholar's mind, after the manner of the almost awl-sufficient shoemaker, who pounds pegs into the sole of shoe or boot! Yes, and such a teacher gets the shoemaker's face, and has the shoemaker's limitations of life—leather, nothing like leather, if leather brings abundant profit! How greatly such awl-punching and peg-pounding teachers are to be pitied, and still more, their pupils!

The true teacher in literature, philosophy, or medicine is unworthy his high vocation if he does not do his work in such a way as to inspire even the dull pupil with love of knowledge, love in searching for it as for hid treasures, love in its posse sion as something better than fine gold.

The physician at the bedside makes a picture of that patient physical condition, and of the psychical condition too, entering into the soul, and reading thought, feeling, emotion. Often that task may be tedious, trying, difficult, but generally not impossible; and when he gets firm grasp of a few facts, bodies forth, by the power of imagination, the form of a thing unknown, just as great English anatomist having placed before him the sing bone of a long extinct animal, constructed the complete skeleton

"All life's work that is not merely drudgery and routine, mu be done, is best done with an ideal before the mind, and a science grows, and knowledge, the greater the necessity for a active transcendentalism to possess the human mind."

How much our religious life depends upon imagination for i vigor and growth! We walk as seeing Him who is invisibl We are brought more and more under the influence of the u seen and eternal, and only when the imagination has livit power and plenitude, will it be possible for the soul to realize

"Such delights
As float to earth, permitted visitants!
When in some hour of solemn jubilee
The massy gates of Paradise are thrown
Wide open, and forth come in fragments wild
Sweet echoes of unearthly melodies,
And odors snatched from beds of amaranth,
And they, that from the crystal river of life
Spring up on freshened wing, ambrosial gales!"

And now, concluding the discussion of the subject that I we desired to present, there abide for those college students we intend to study medicine, these subjects to which they shou give proper attention: Modern language, as represented I German and French, English Composition, Psychology, Biolog and Imagination, and the greatest of the five possibly is Imagination.





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